

ARCHITECTURE DEPARTMENT

MASTER OF ARCHITECTURE PROGRAMME

CHINESE UNIVERSITY OF HONG KONG

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DESIGN REPORT



A PLACE OF EXCHANGE MAKING THE AMPHIBIOUS HABITAT

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A place of Exchange
making the amphibious Habitat

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Content

0.0 Thesis Statement

Thesis Statement

The Thesis is to heighten the awareness of 'Canton's' history--how and why the city starts. The datum line is where that part of history started--the coastal-line at the moment because that piece of history about the exchange/ trading is more significant than its history of 2500 years in Guangzhou (Canton). So, the idea is an anti-thesis of the archeology of land, but rather a thesis of the archeology of water. One is to go deeper; the other is to go higher. Then the architecture is to allow both to happen, that the datum and the ship (as a piece of land) are where I start to investigate. They become the shaping force of architecture to create the passage for exchange. As an audience, we can participate at different time strata to see, witness and create a new maritime culture that is contemporary rather than historical.

A story

The Floating History of Canton Port

The story of Zhoulou zui Port

140-87 BC
Origin



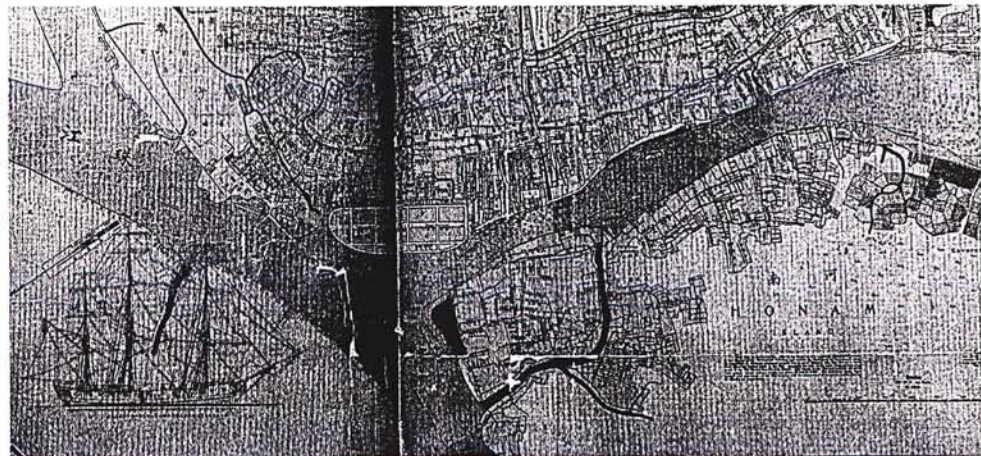
The maritime Silk Road had its origins during the Han Dynasty (202 BC-AD 220). Since ancient times, these areas have been thriving centers of ship-building as well as silk production. They were thus able to supply both commodities for export and the means to transport across the sea.

The maritime routes opened by Emperor Han Wudi (reigned 140-87 BC) provided access to the Roman Empire via India. This enabled China to actively seek out overseas markets and establish foreign trade relations, and laid the foundation for the development of the Maritime Silk Road.

Foreign Trading -

Canton then bloomed to be the center of foreign trade from the time of the Tang Dynasty from 618-907 AD onwards. The Portuguese landed in Canton in 1517, followed by the Spaniards, the Dutch, British and French. With all these settlers, the harbor grew larger. During his time Hong merchants in the Thirteen Factories, under the Canton System, the Qing Dynasty saw a short period of trade prosperity.

618 - 1970
Heyday





*Trading
Intervention*

Mid-eighteenth-century Chinese imperial decrees restricted foreign residence to a set of Chinese-built dwellings on the banks of the Pearl River known as the Thirteen Factories (in Mandarin, Shisan Hang). Factory is used here in its original sense as the premises of a factor, or merchant. The Thirteen Factories remained the primary center for Western trade well into the mid-nineteenth century. The necessity of close collaboration between foreign merchants and Chinese employees and peers on the one hand, and the tensions created by attempted foreign interventions in the face of a fiercely independent local populace on the other, helped shape the factories and their surrounding urban spaces. The Zhoutouzui is at the river juncture of the trading centre. Large amounts of warehouses were built to satisfy the need of trading. After years, it soon became an important port for unloading the cargo.



Many boats provided coal, charcoal, and firewood for fuel, while others specialized in ships' supplies. Many others raised ducks on nearby farms and supplied eggs and duck meat to the ships. At one point thousands of these ornate, palatial boats prospered in that busy port city.

The number of people living in them is estimated now at seven hundred and fifty thousand. In the evening there is a solid mass of them about two hundred feet wide and six or seven miles long. Every small boat has one family at least living on it, and the large ones have several. Each family averages four children. The boats are their homes, and they make their living by carrying passengers and freight of all kinds. The river is so crowded with boats of all kinds and descriptions that it is with great difficulty a stranger can navigate through them, but like people in a crowded city street the natives get on without many mixups..."



The First Opium War has an important impact on Zhou Tou Zui Port, as it is one of the ports that at the trading centre of Pearl River. At that time, it's already one of the important ports for British cargo transportation. In 1847, the British army tried to force the Canton Government to turn the whole Zhou Tou zui district into British concession. It caused the famous Zhou Tou Zui rebellion in May. The local people in Zhou Tou Zui successfully drove the British Army off their land.

Numerous uprisings started at the start of the 20th century by C Sun Yat-sen. Modernization started in 1918, wide streets were laid out, shacks were torn down, Canals were filled in and the city walls were taken down.

The first Coastline Reclamation in Zhou Tou Zui Port was started in 1930s. It's to build a larger port to unload goods for the British trading companies.



Modernization

Years later, in 1950s, Canton became a vital center for industry and foreign trade with products sold such as steel, foodstuffs, chemicals and textiles. This development led to the famous Canton Fair being held twice a year. The Zhou Tou Zui port is restored again for set up an important inner river port. Larger pier for cargo vessels and more land for building warehouse. The land fill replaced the original coastal line, floating city on the Pearl River then disappear. It officially started its roles of transporting people among Hong Kong, Macau, and Hai Ko and handling more cargo for later industrialization in Zhou Tou Zui. The current Guangzhou Port Authority is found in Zhou Tou Zui Port at that period. With the growing of the port, the largest fish market and aquatic company rise at the other corner of river front in 1960s. They become another import economic of to sustain the Zhou Tou Zui district.



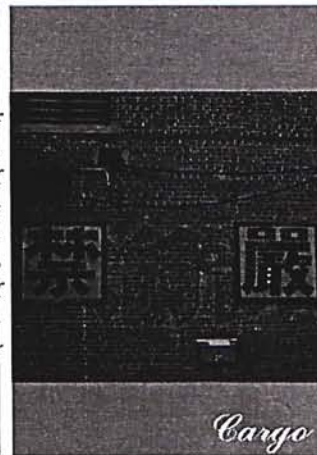
Fish Market

Fish market and the Aquatic Company were found in 1960s as part of the cargo port. The market is still survived after years declined. A new river tunnel to the Fang Chun district is planned to build. The market and have to be relocated in a new place.



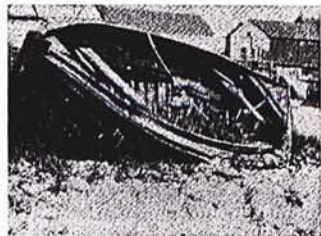
Pier

The Port was a collective memory of Canton people, especially to the generation in the Great Proletarian Cultural Revolution. The Zhou tou zui Port was the place for those young city people departed to Haiko. They were forced to leave home and school for working and living in the farmland in Hainan province for 10 years, which changed their whole life.



Cargo

In the 80s, The factory started move out to surburban area and Train replace the major role of trasportation between Hong Kong and Canton.



The original Pier building is demolished, only few warehouses is remained and renovated into work and storage space for Guangzhou Port Authority. But the texture of the brick word and the signage of the original port are still telling the story of the port.



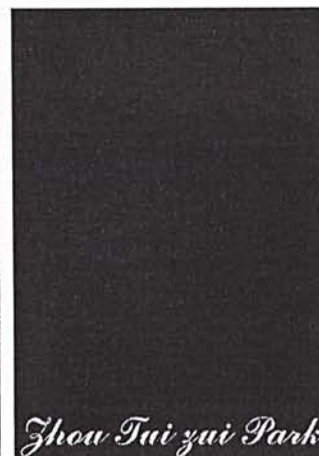
1980s - 2010

Decline



2001-

Restoration

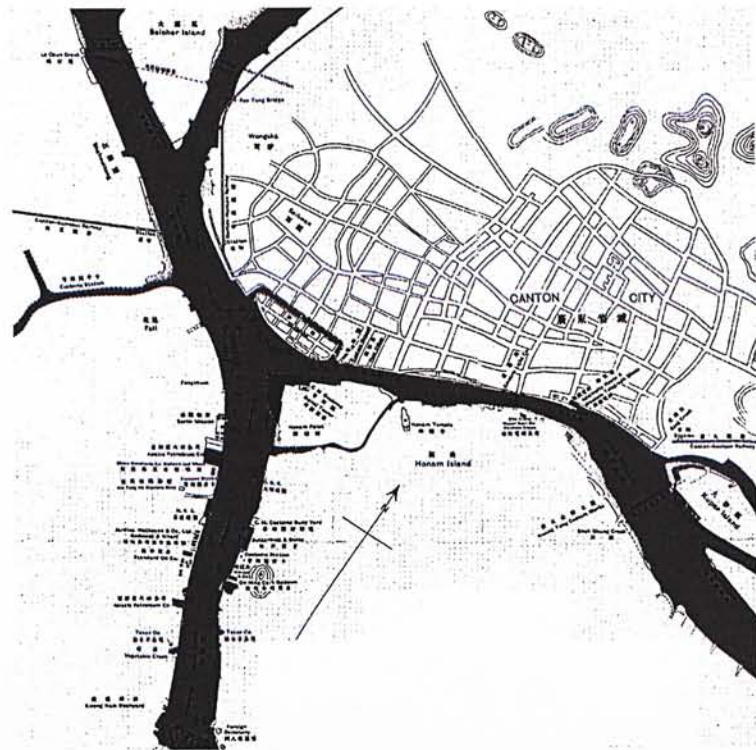


The Guangzhou government started planing the restoration a new zhoutou zui , becuase it's value and spirits in Canton's history.

A Zhou zui Part was a care of the incifcent of public space in zhoutou zui district. A memorial was landed on the centre of the part to remind the glory past of exchenge.

Zhou Tui zui Park

Hisotrical Evidence



Hisotrical Evidence



Foreign Embassy island



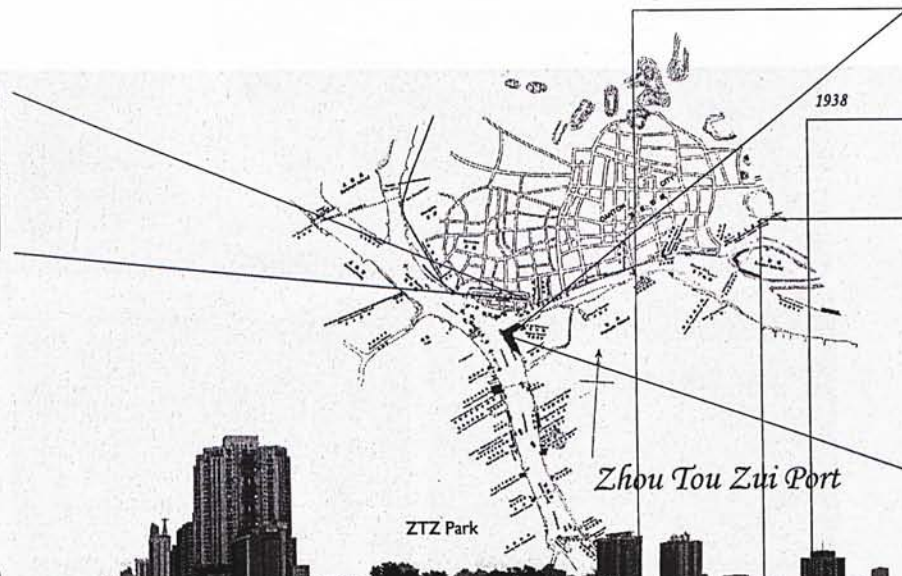
Trading



Floating City



The Hong Factories



Swan Hotel

Sha Mian Island

ZTZ Park

Zhou Tou Zui Port



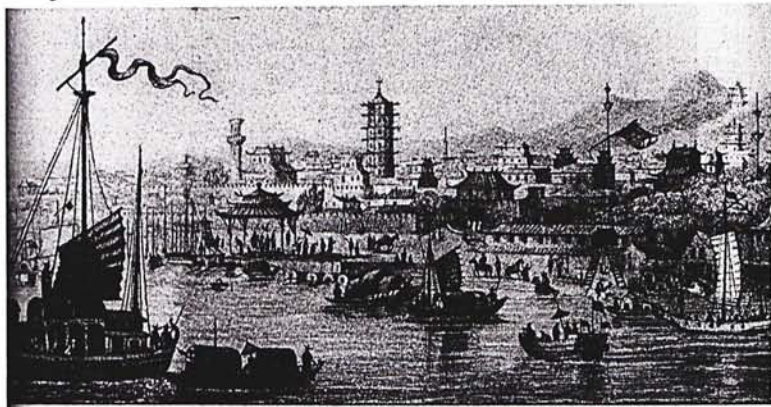
1950s



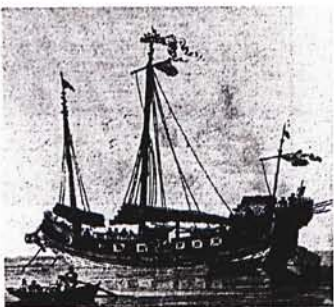
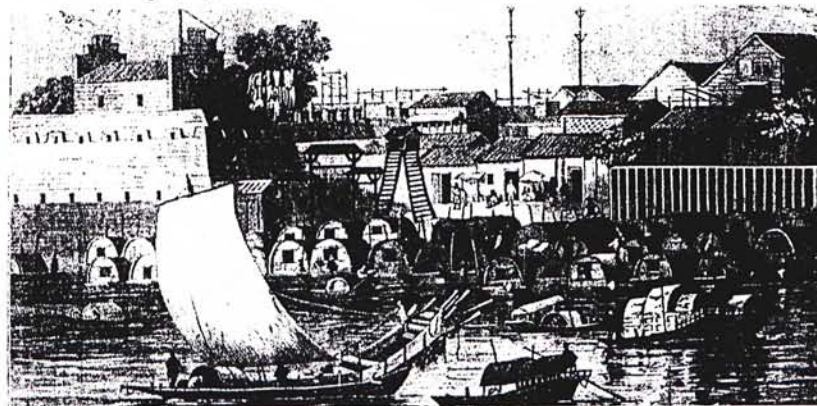
Pearl River

1.3.1 *The Amphibious Living Habitat*

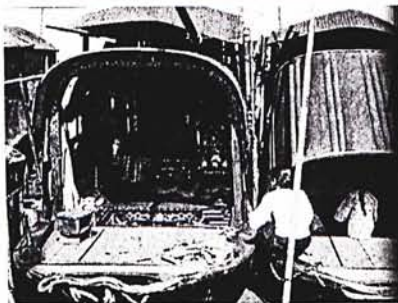
Busy Pearl River in Ching Dynasty



The Floating City



Boat Chain



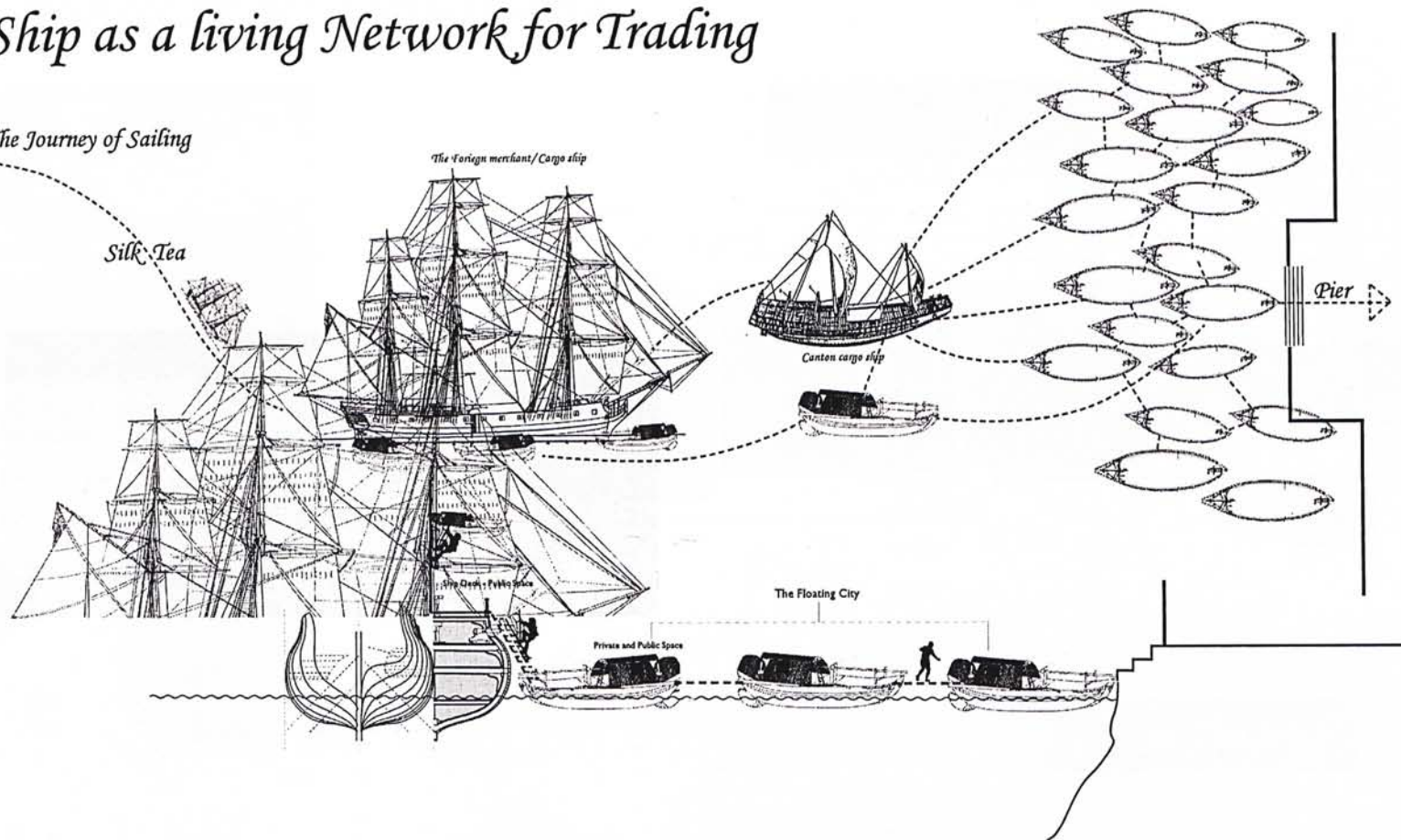
Private Living



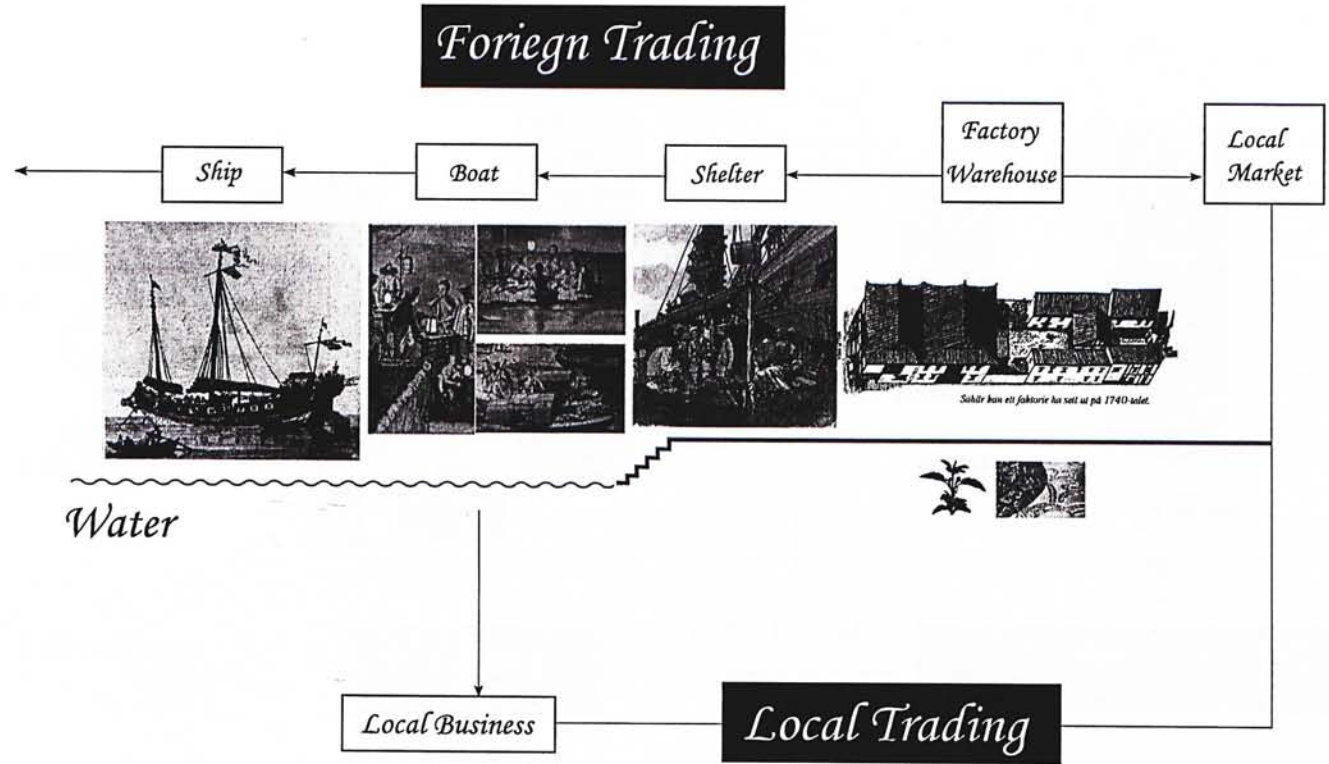
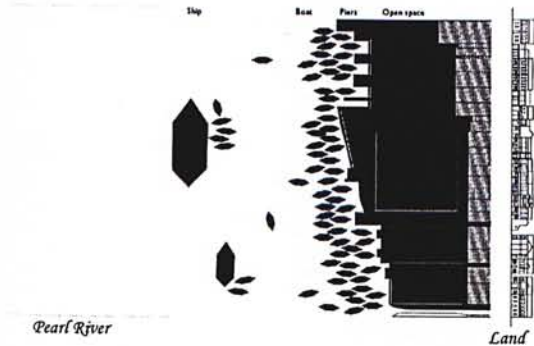
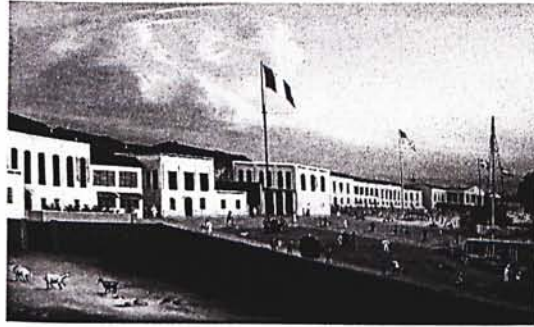
Public Space

1.3.2 Ship as a living Network for Trading

2.5 The Journey of Sailing

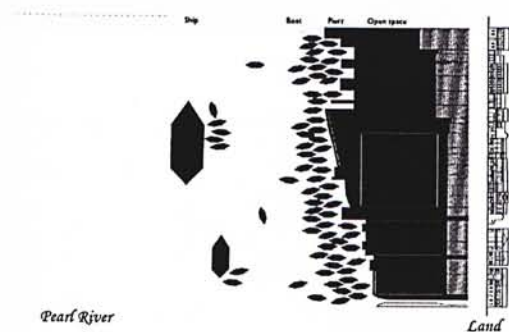


1.3.3 Architecture of Trading Chain



1.3.4 The Mode of Exchange Chain

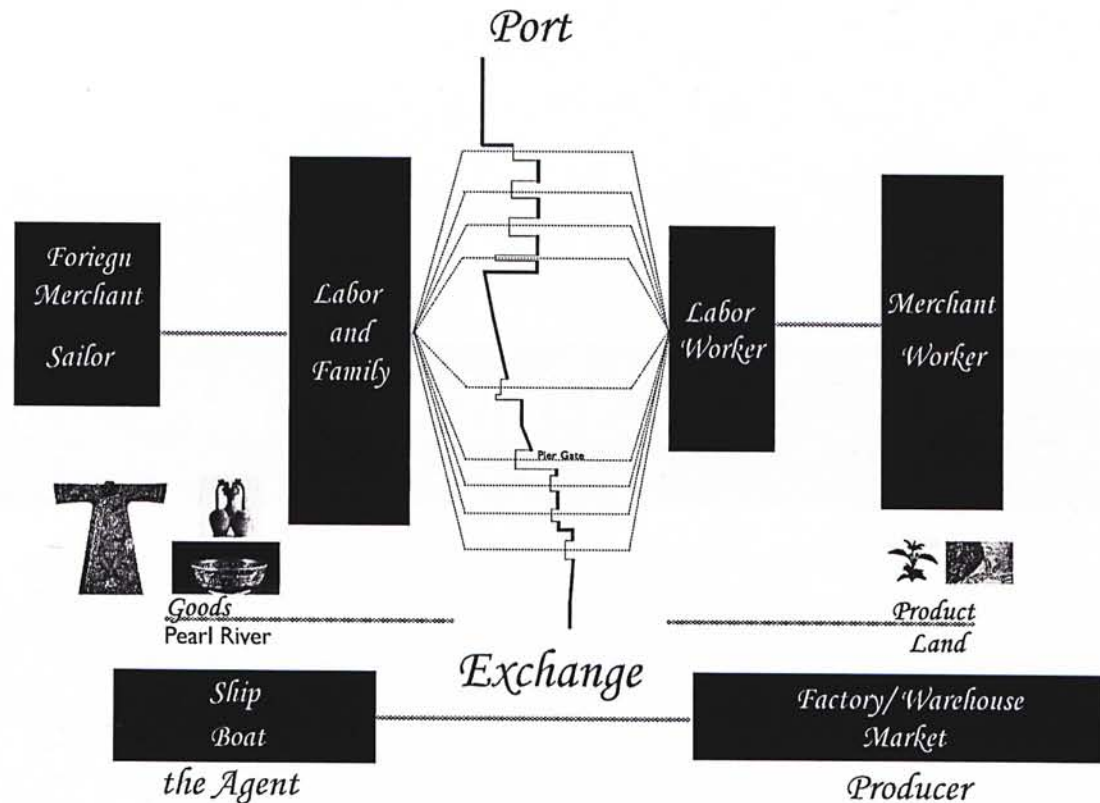
The Port is a facilitator to of prosscences oc-
cruing simulataneously across thousands
of products and people and through a
dense network space time and forms of
movement.



1. The Community

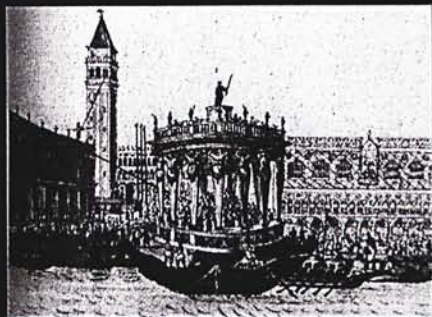
2. The Product

3. The Architecture



The Exchange between Water and Land

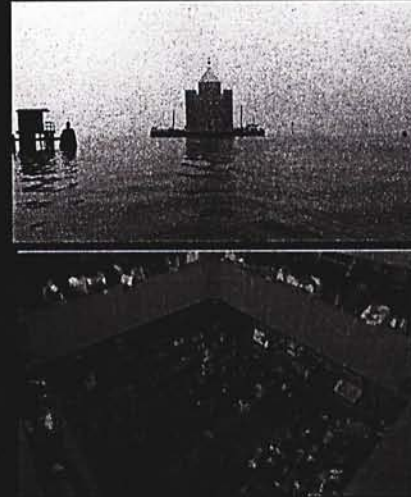
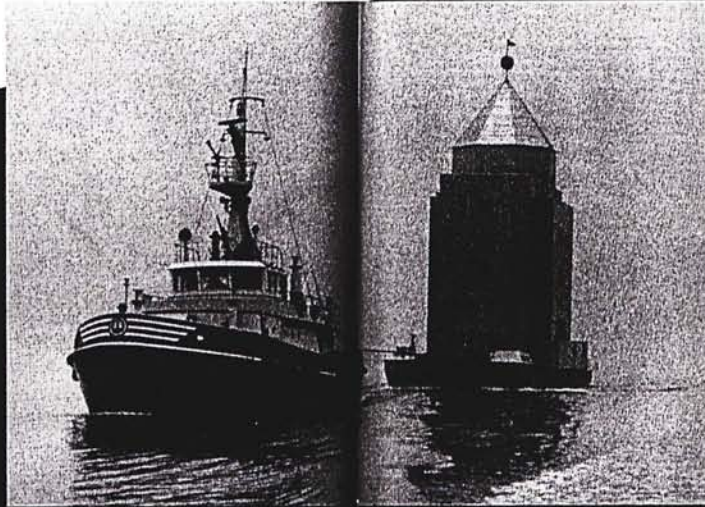
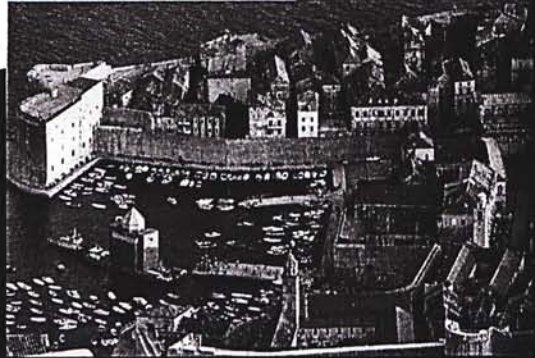
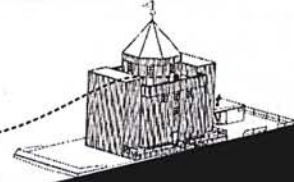
2.1 Addition : Ship = Land



Recall the floating theatres which were so characteristic of Venice in the 18th century. The present scheme modified certain features of these theaters, while retaining the concept of building-cum-barque.

Case Study - Teatro del Mondo (Floating Theater)

Aldo Rossi - Venice Biennale

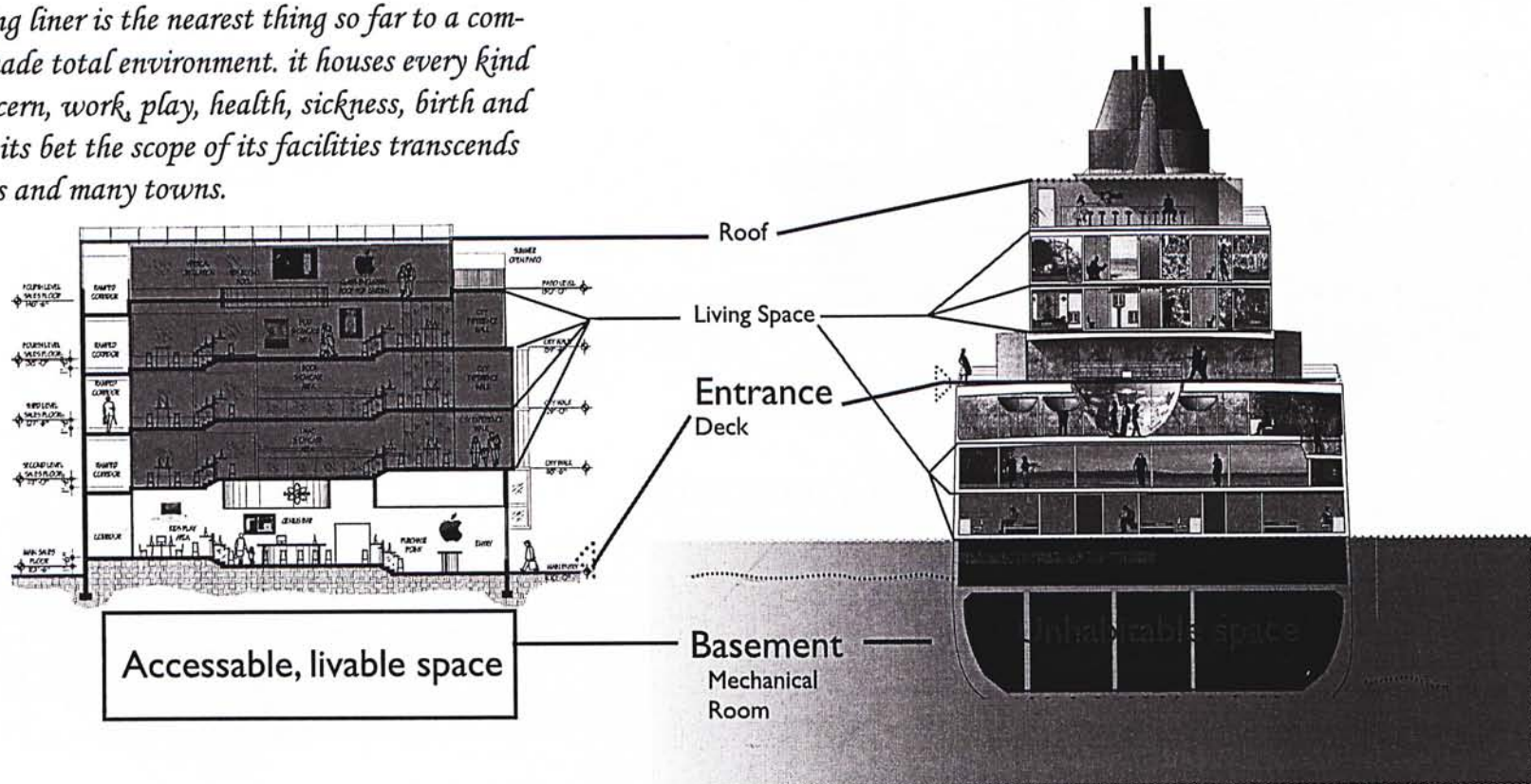


“seemed to me a place where architectue ended and the world of the imagination or even the irrational began.”

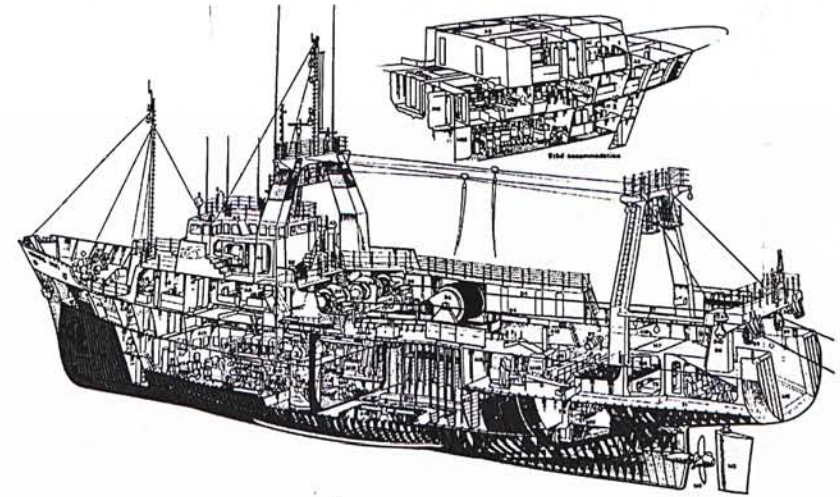
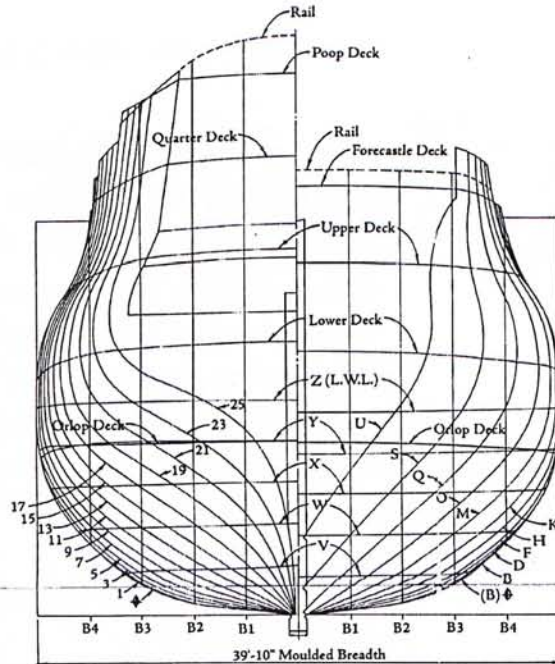
-Aldo Rossi

2.2 Ship Perform as a Building

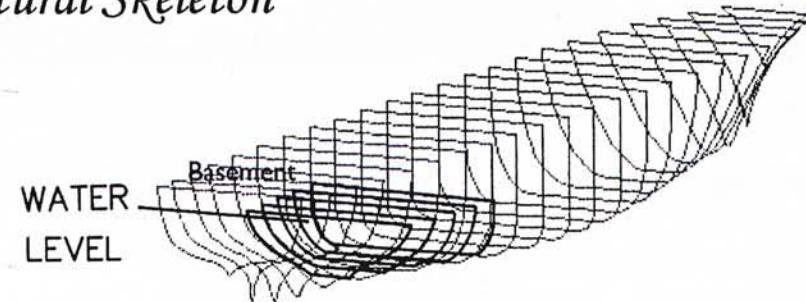
A large cruising liner is the nearest thing so far to a completely man-made total environment. it houses every kind of human concern, work, play, health, sickness, birth and death, and at its bet the scope of its facilities transcends most buildings and many towns.



2.3 Hull to resist water



Structural Skeleton

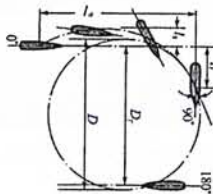
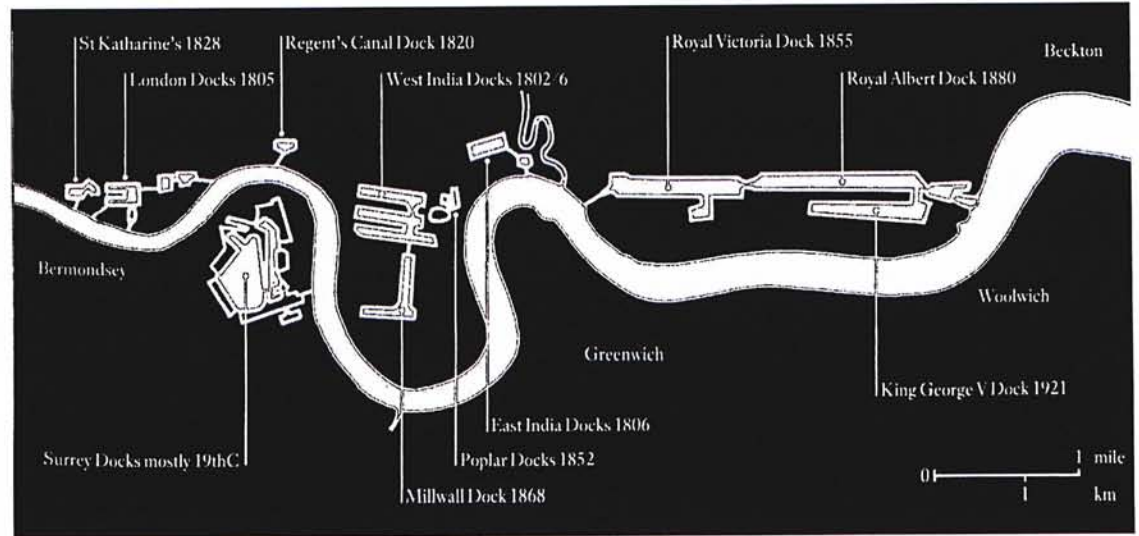


2.5 Subtraction Docklands

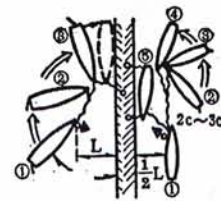
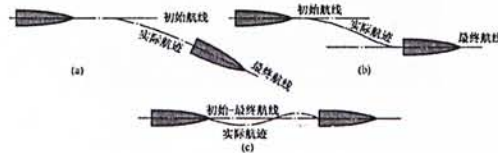
*The place of making the openings for
Exfcange*

- Case study: London Dockland

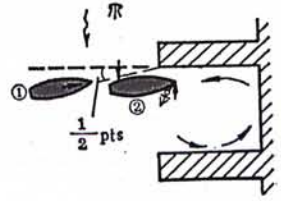
*Land Subtraction creates the path way for
the ship. The subtraction let the ship brings
water into the land. The way of subtraction
follow the dimension and navigation path-
way of the ship, since the ship move under
constraints of its shape and nevigation. Here,
the sense of water and land is ambiguous.*



Water

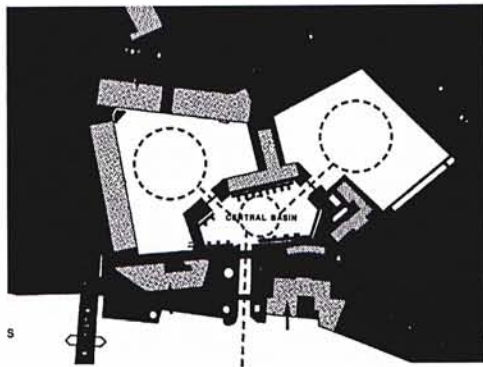


Land

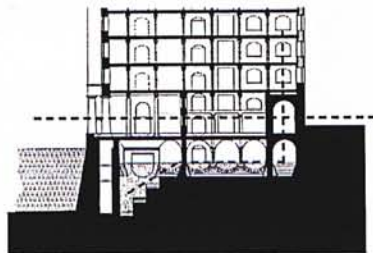




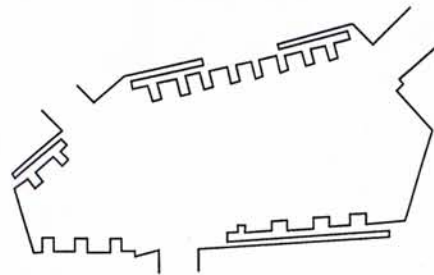
1. Buildings surround the Subtraction



2. public platform to connet the ship



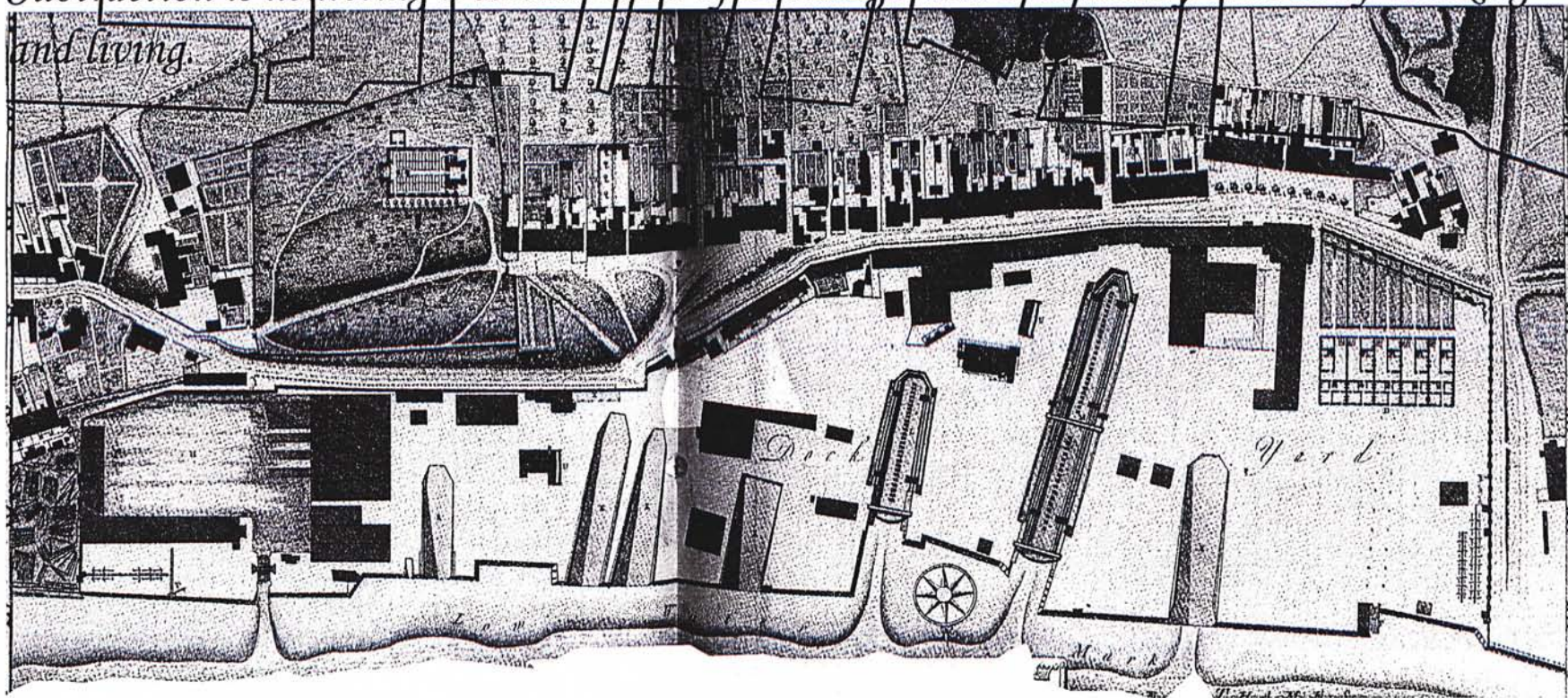
Subtraction is neutering a certain scale of buildings and community around of working and living.



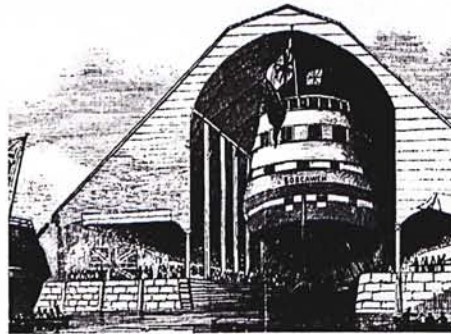
3. addition (Piers) after land subtraction

2.6 Dock Yards

Subtraction is neutering a certain scale of buildings and community around of working and living.



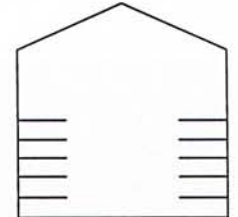
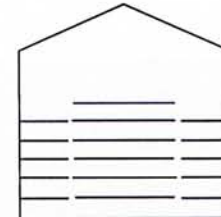
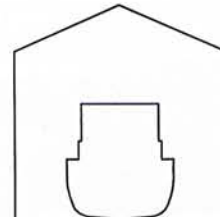
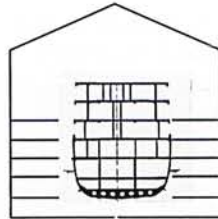
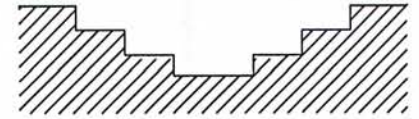
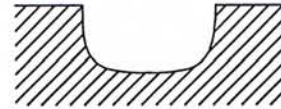
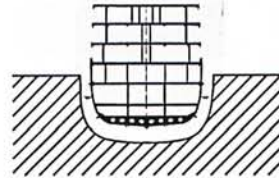
Dock Yards



The relationship of ship and land, ship and Dock yard

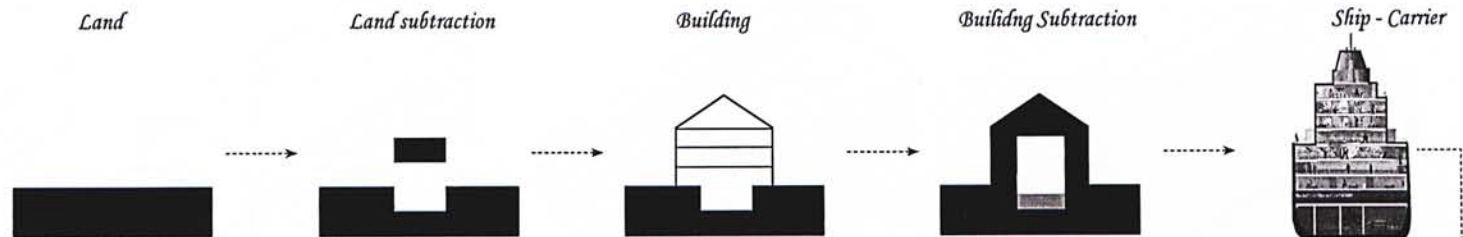
Dock; the land shape is created to perfect match the shape of the Hull.

Dock Yark; The Dock building is designed to have standard levels to connet different leverls in a ship, during the manufacture process. The level can be adjust for different type of ship or different time according to the production progress.

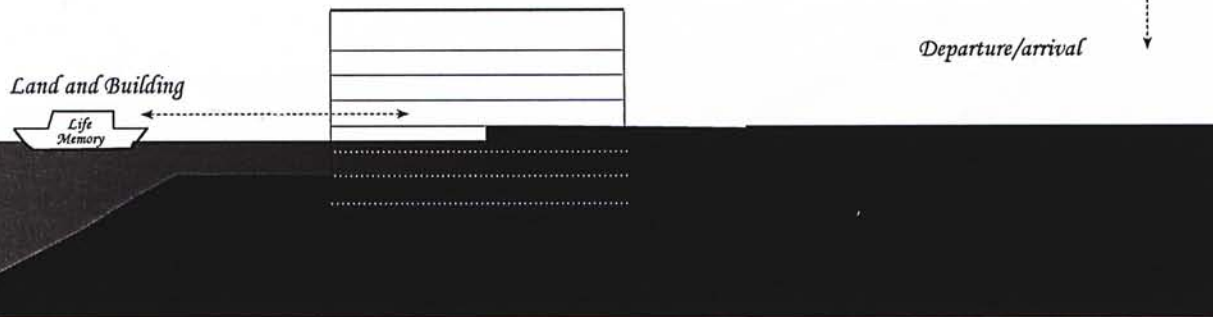


2.7 Docks - Subtraction

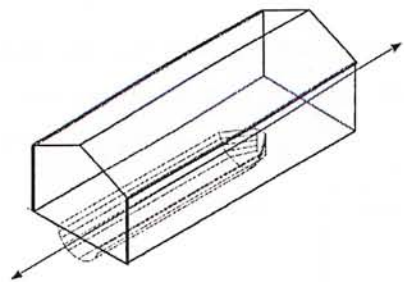
Land Subtraction is to create the place of docking (stay). Both land and building is subtracted to let the water can get in. The Exchange between land and water, building and ship happens in this opening.



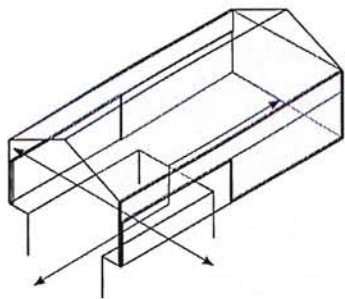
The subtraction creates multiple levels (height) within the building. It's a place of making the spatial experience of among Land --- building --- ship --- water as a whole body.



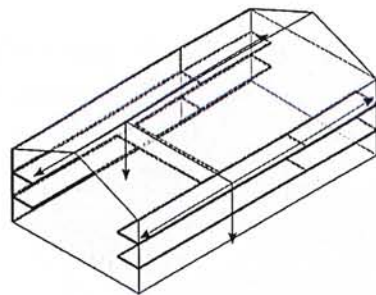
Dock Yards



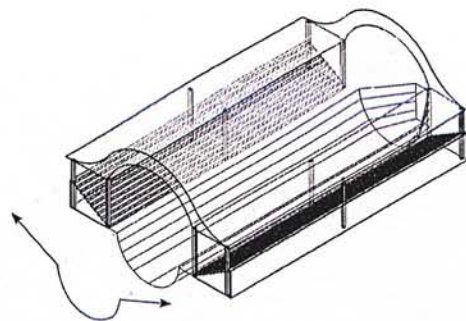
(A)



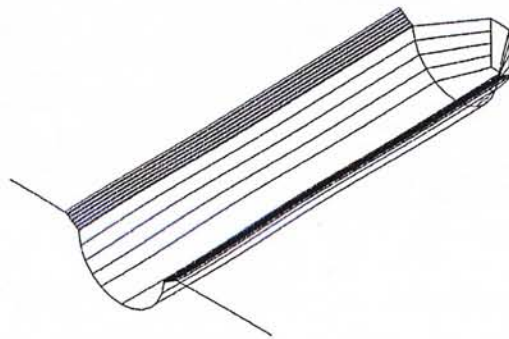
(B)



(C)



(D)

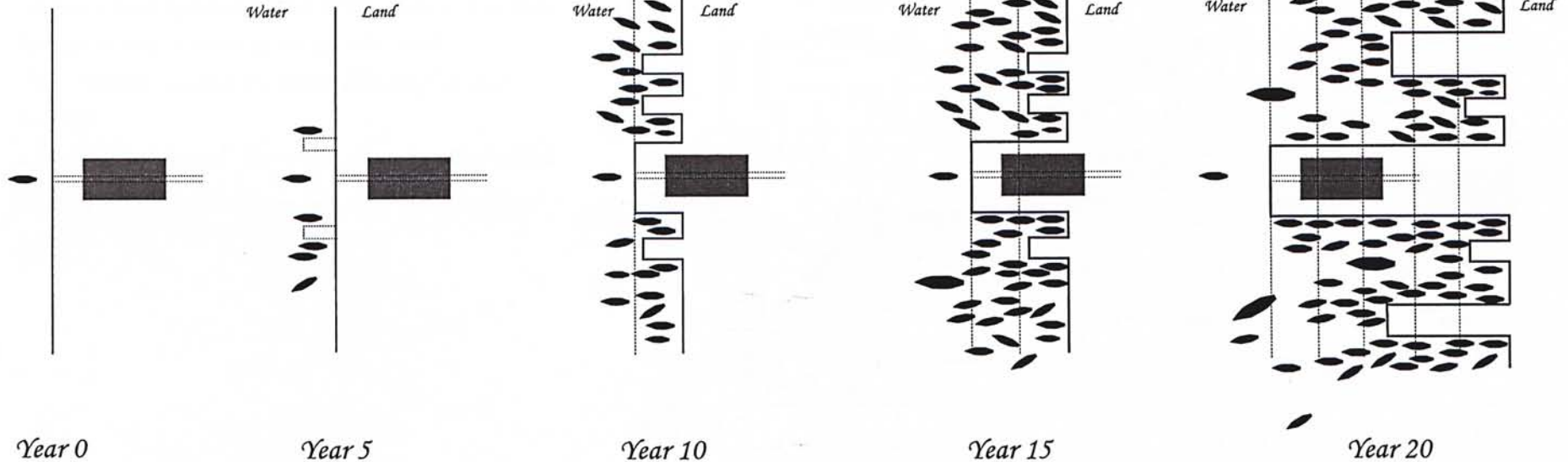


2.8 Docks - Subtraction

Ship = land

Subtraction = addition

Imagine the Use land as resources to making the ship. After years of running, the land consumes and the water returns. Ships comes and goes, create a ever-changing floating city by the coastline.



2.9 Ship- Addiction ----- Return - Subtraction

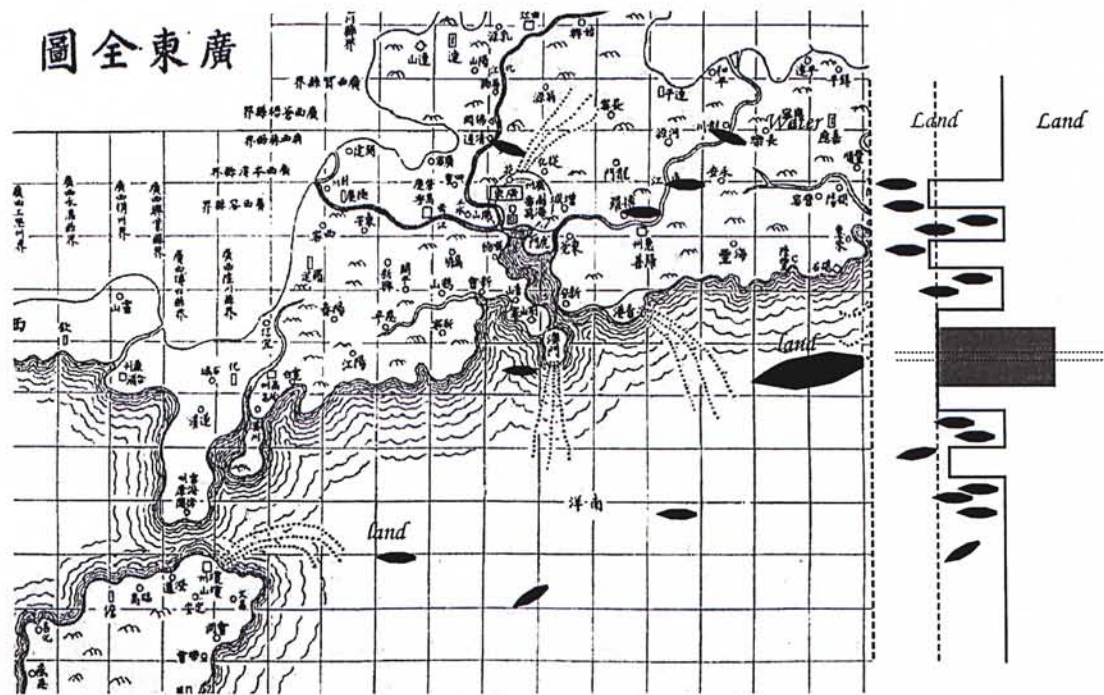
Land and water is in an equilibrium form that one goes deeper the other goes higher.

Ship is like a kind of land reclamation which let water get further go inside the land.

This process created an accessible amphibious habitat.

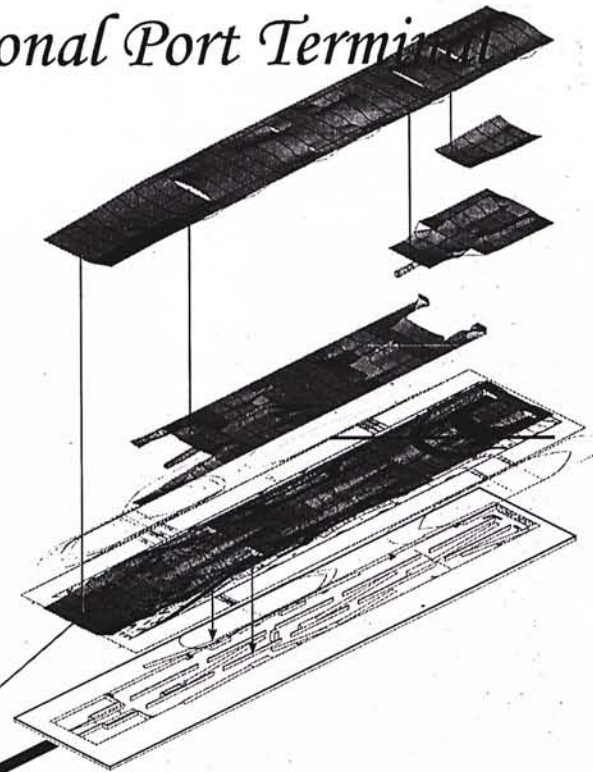
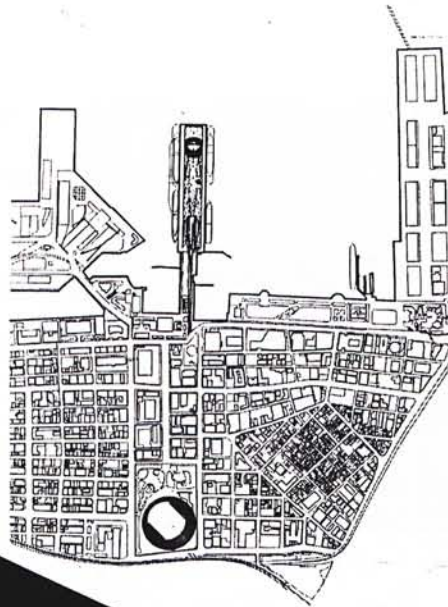
Land (ships) travels from one place to other place.

They unite the river, the city and the world together.



2.4.2 Case: Addition Yokohama International Port Terminal

The Case Yokohama port terminal is create a public space on the water. A land of inviting both Ship. It's a agent or exchange place



Plaza
(Public Exchange)

Civic Exchange

Leisure

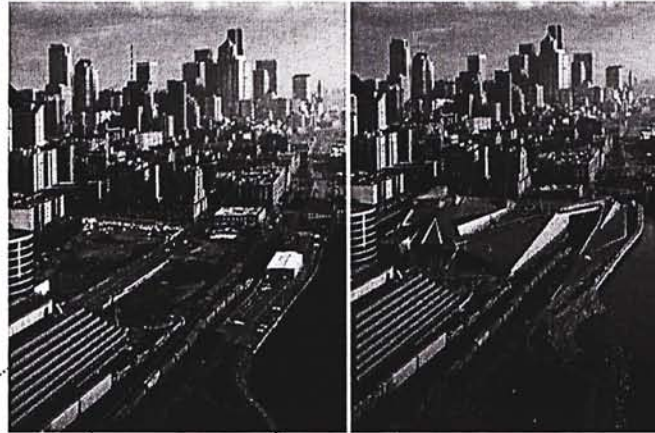
Terminal

Structure

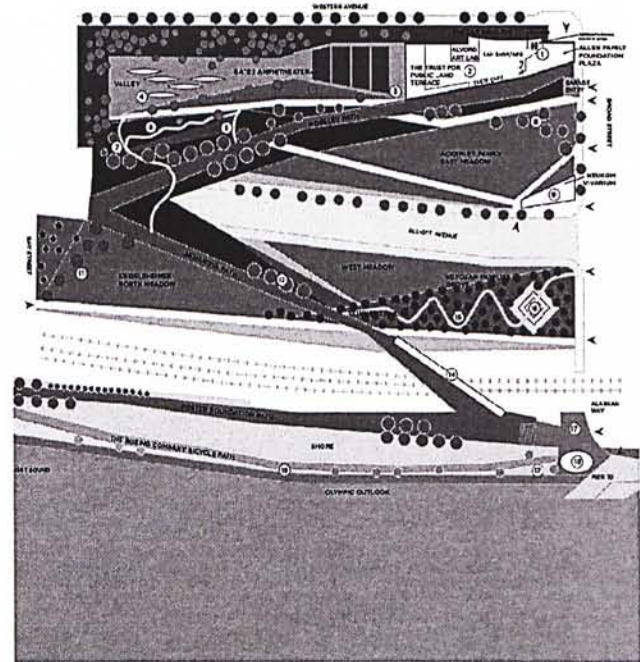
Parking

2.10 Case Study - Seattle Olympic sculpture Park

*The land comes back to the water.
It is to reconnect the ground above
12-20m sea level to waterfront,
The transformation is redefined the
water front.*



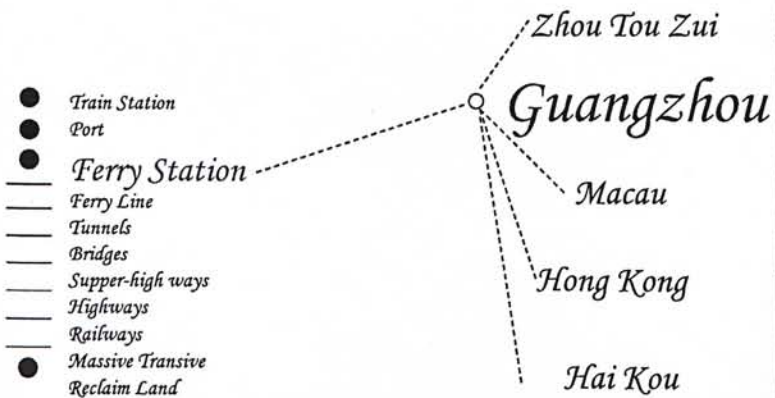
Reclam land



Urban Intervention of

Zhou Tou Zui Port

The Transportation Network of Pearl River Delta

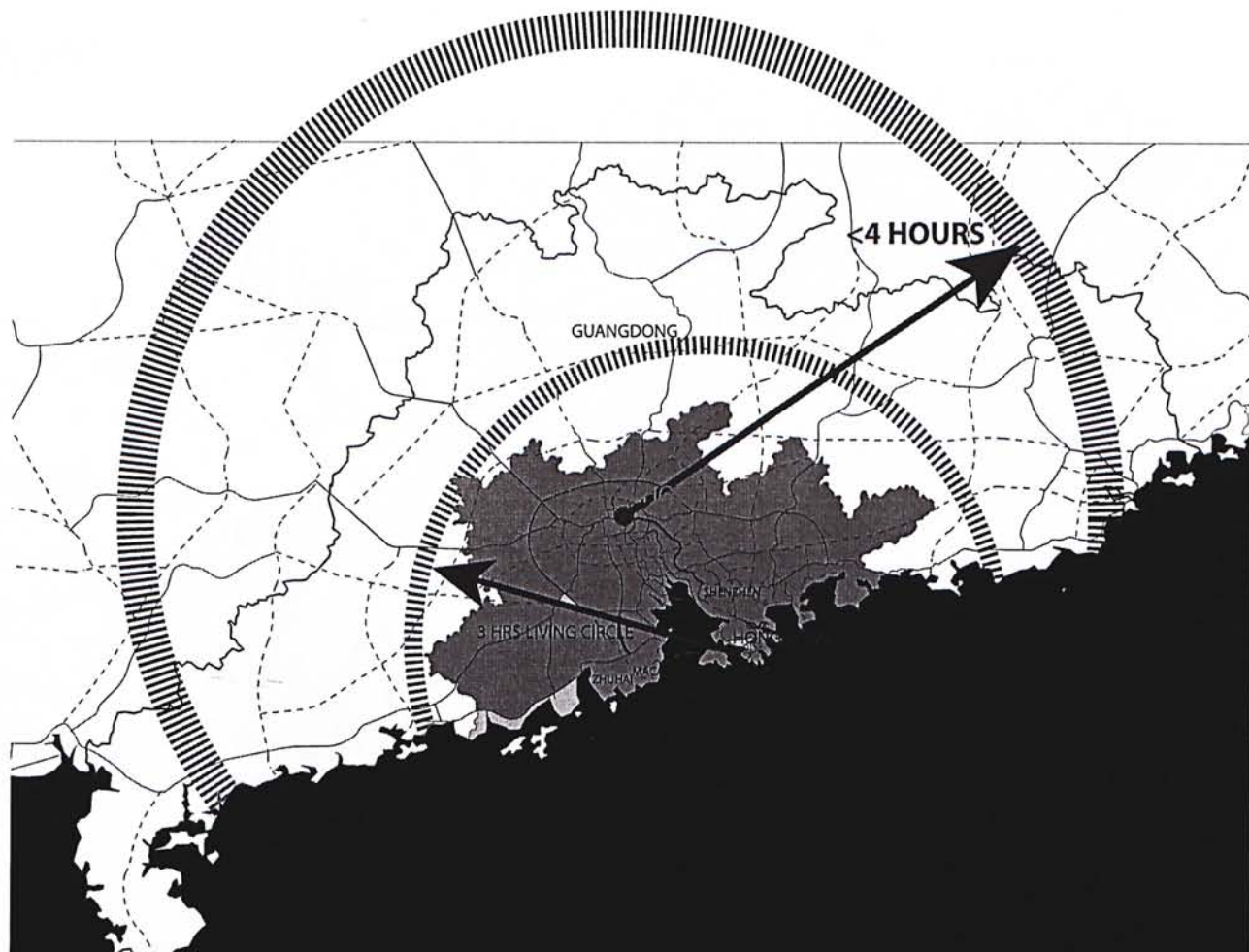


The Government Proposal

*A Journey of
Enjoyment*

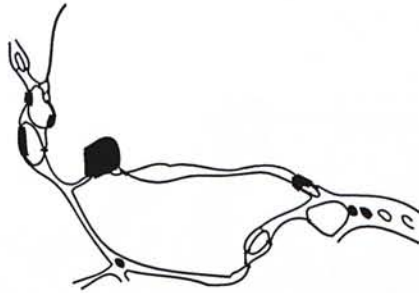
or

*High speed
Transportation*

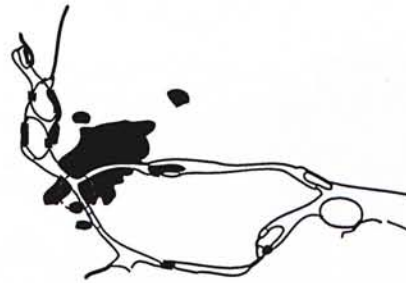


3.1 The Civilization of CANTON

The Expansion of Guangzhou City is started from the Qing Dynasty. The River Junction can be read as the starting point from the mapping. New



Qing Dyansty



1923



1954



1967

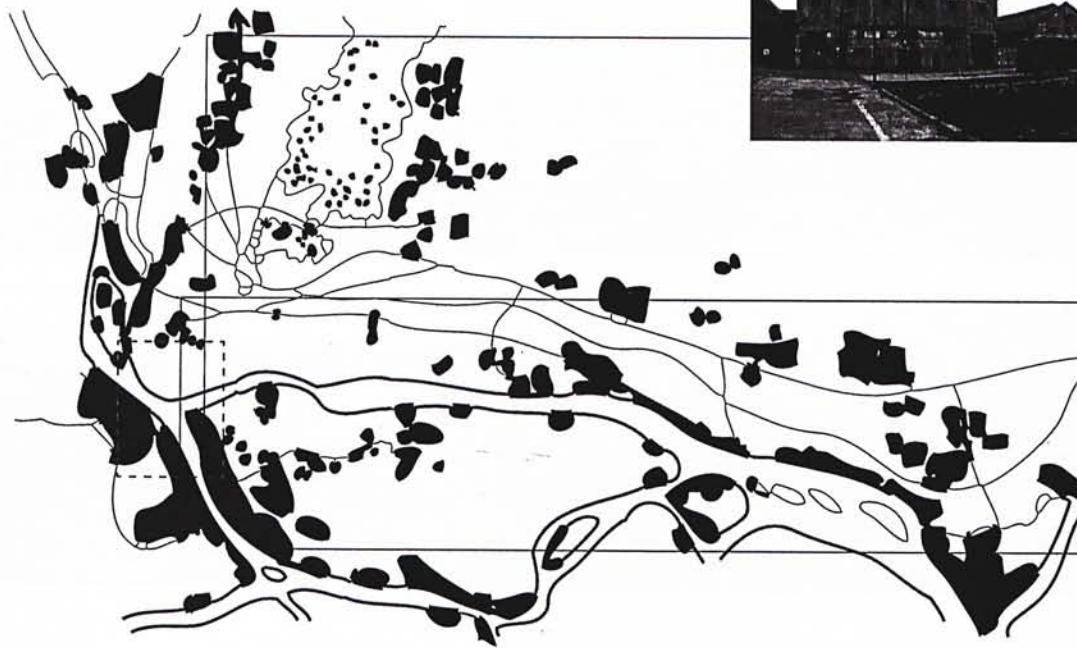


1980s

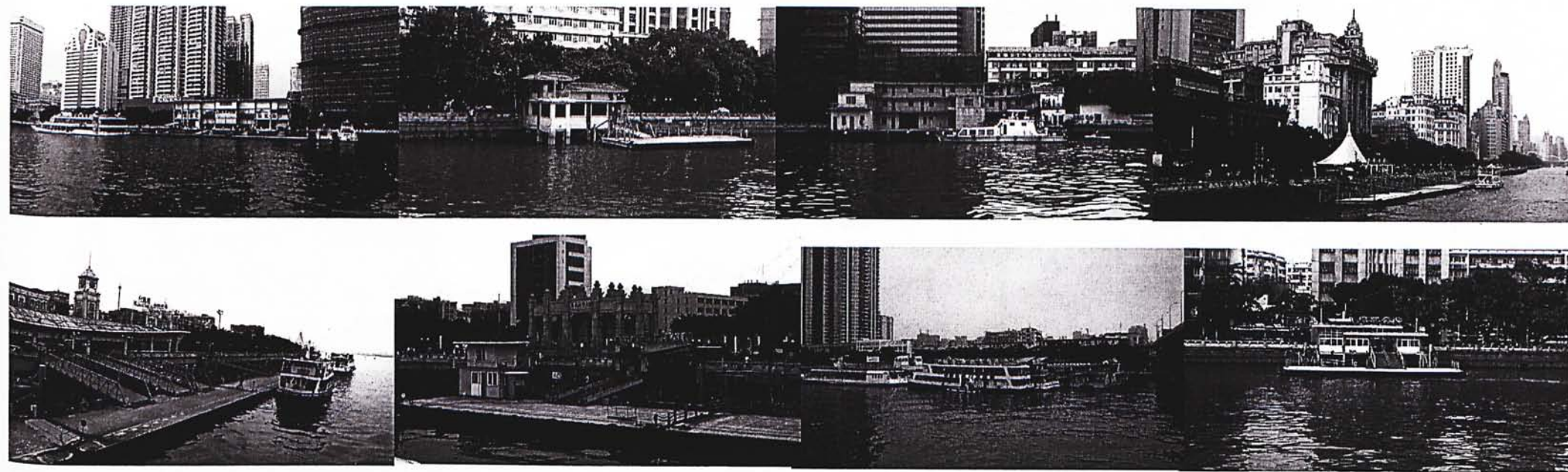


After 1990

Port and Industrial Area along Pearl River



3.2 Piers Along the Pearl River

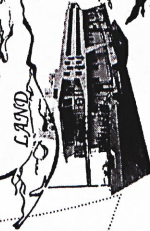




Lie De Pier
Tianzi Pier
Deyuanfangfu pier
University pier



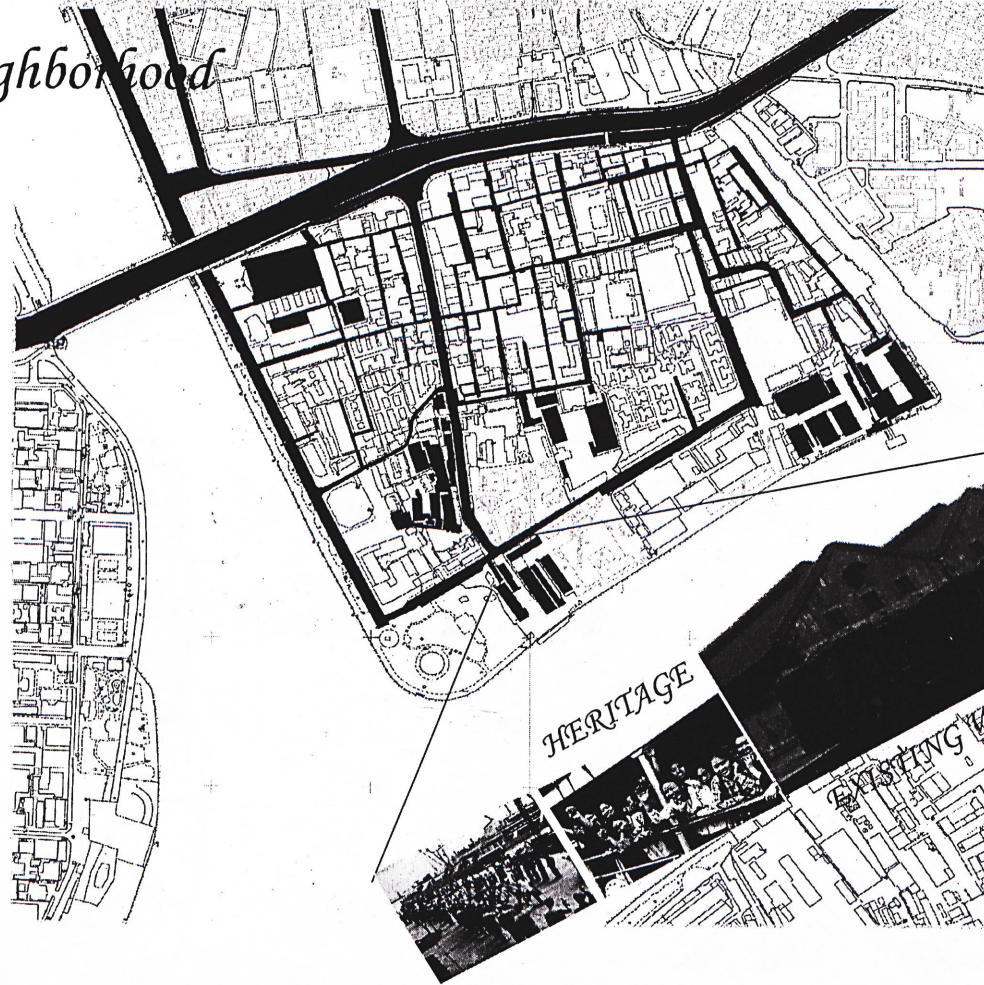
Tong Xing Pier
Sha qi Pier
Tai Xu Pier



LAND

The Port and its Neighborhood

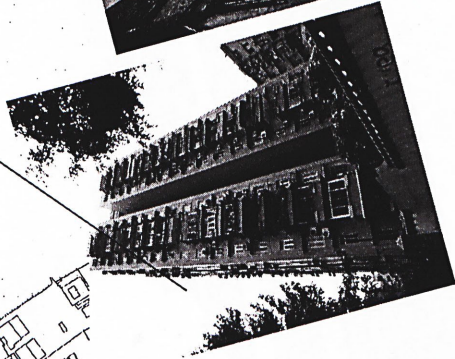
Factory and Warehouse



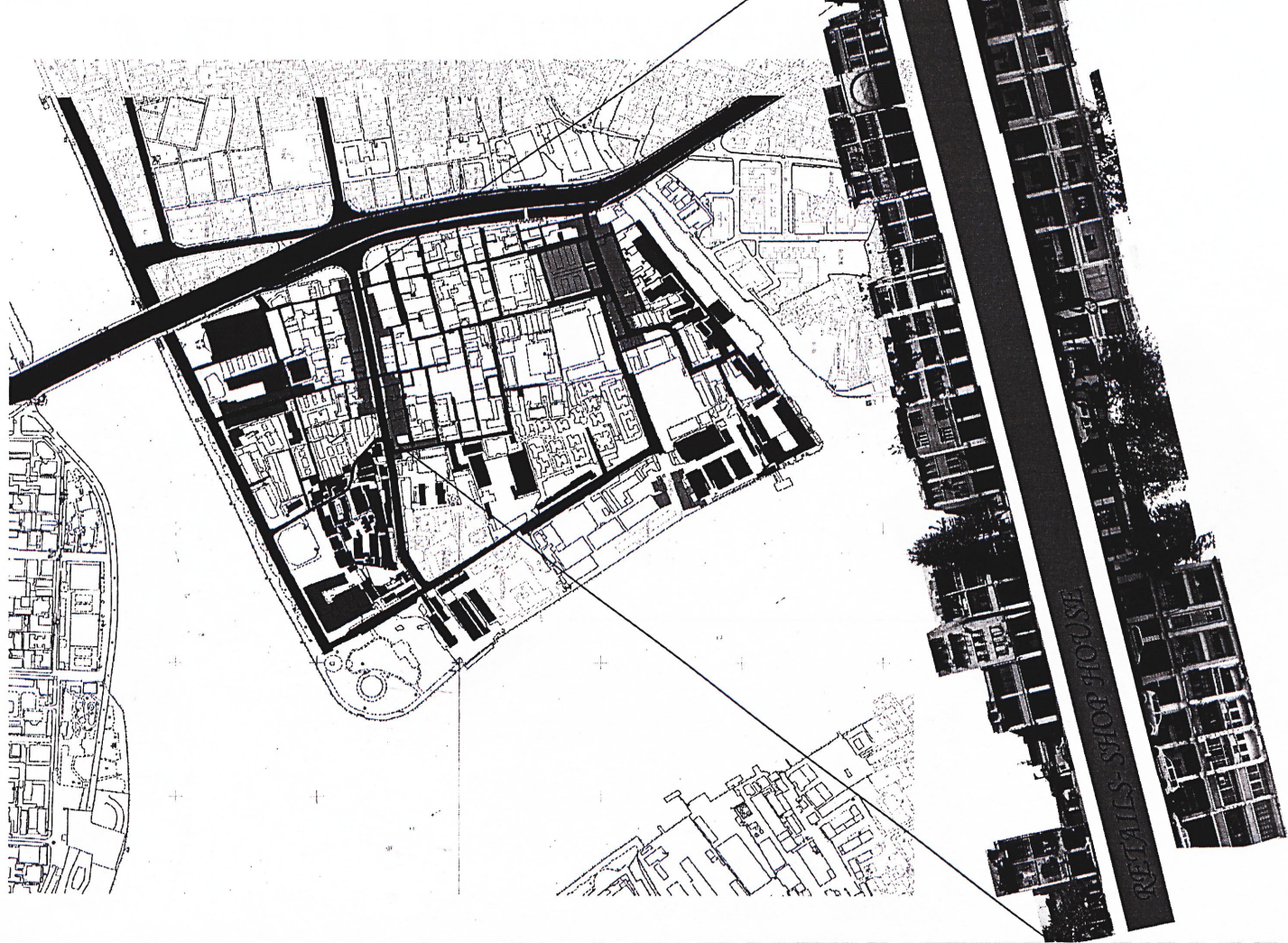
Residential Area



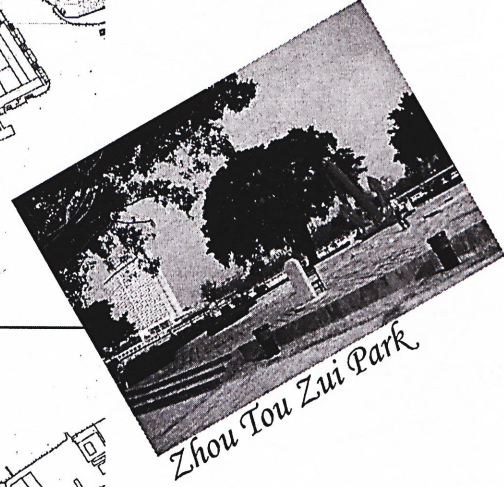
PORT COMMUNITY
CANTON HOUSES



Retails /acomodation



Education / Sports facility



Zhou Tou Zui Park

3.3 History Reclamation for making the Port ENTRY



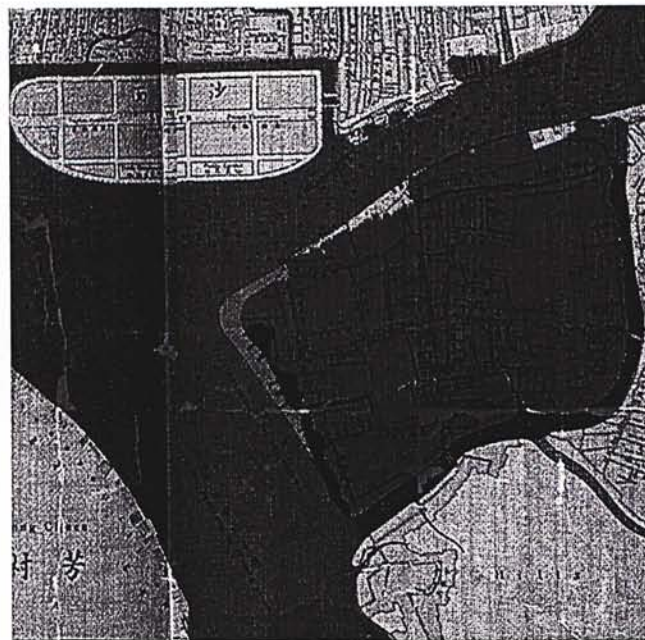
1900s



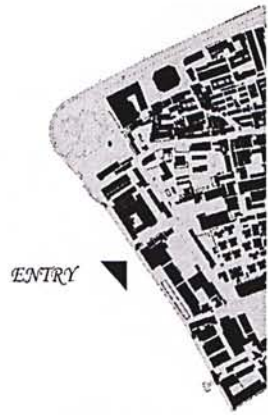
1930s



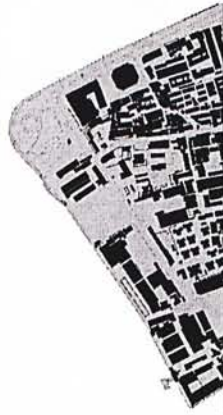
1907
Today



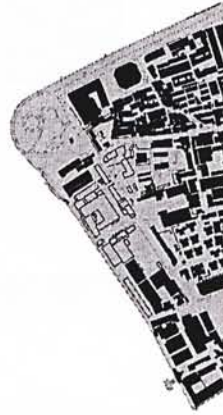
3.6 The *PROCESS* of *DECAY* in Zhou tou zui



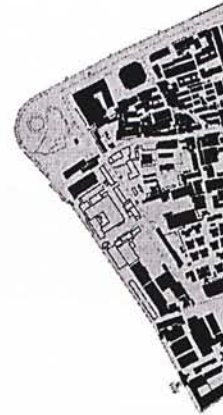
Original Zhou Tou Zui Port



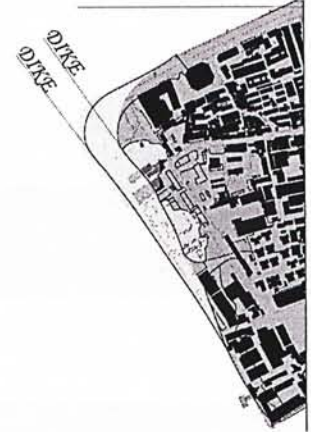
Port Terminal Demolished



Demolished 2 Warehouses

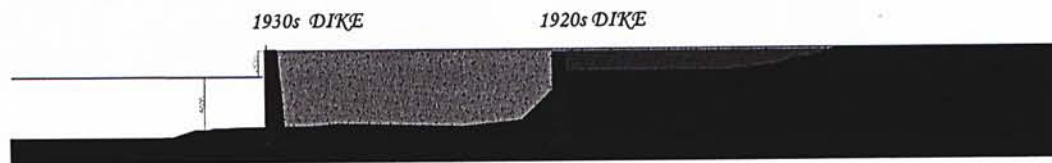
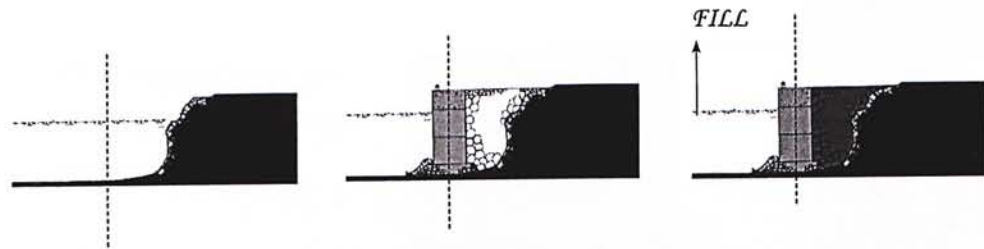


Warehouses Decay



Overlay the Reclaimed Lines

3.4 The *PROCESS* of Reclamation



Pier



Floating Platforms



Vacant Land



Vacant Land

3.1 Port Program study

The Original Port programme is mainly a Cargo port with a Pier

2. Ferry Pier

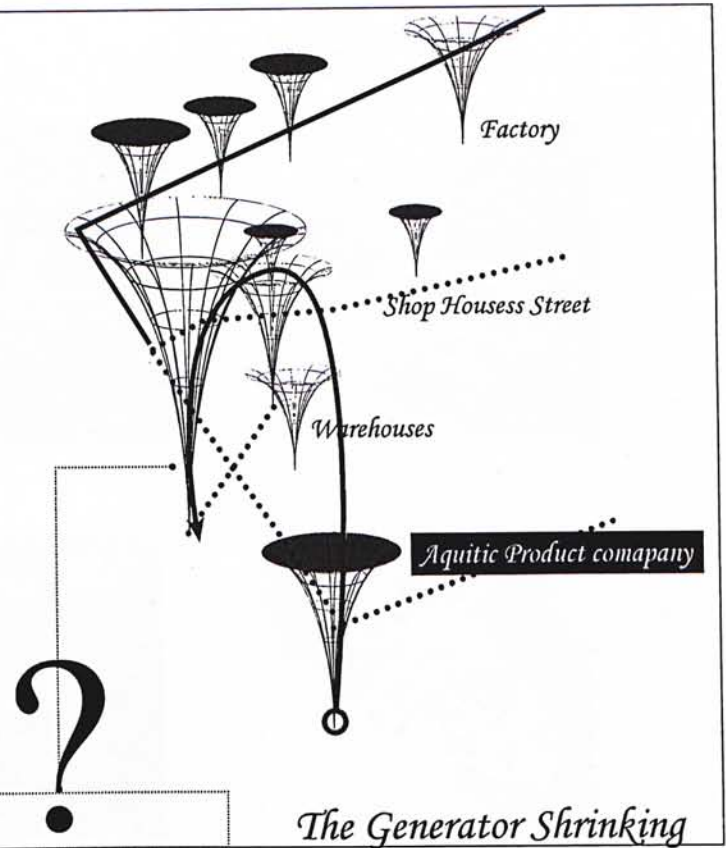
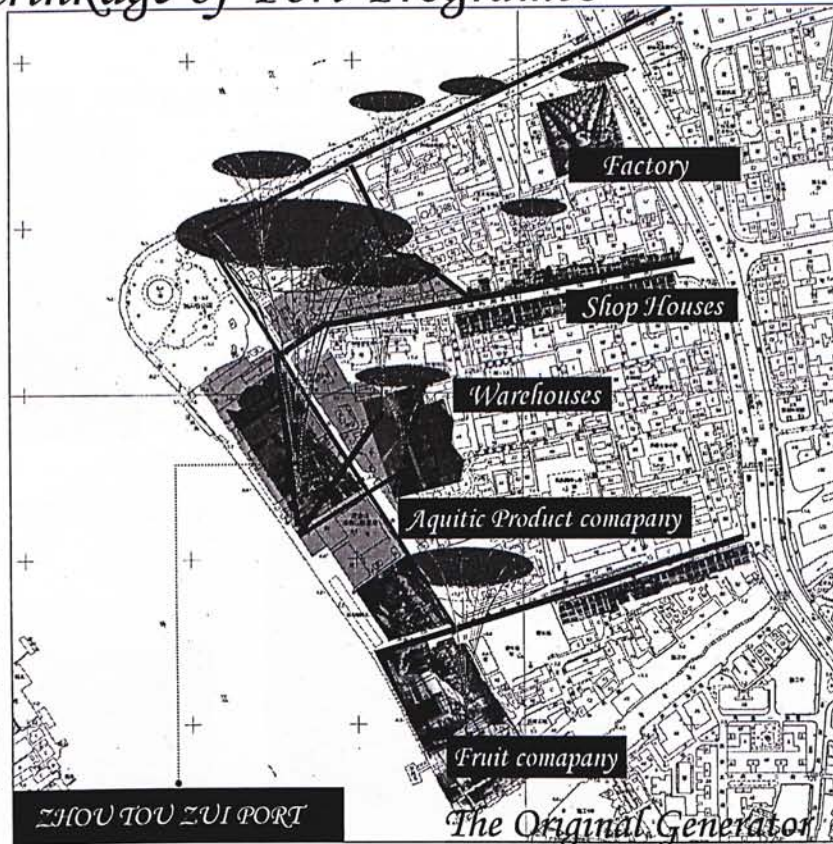


1. Cargo Port



3.1 The Shrinkage of Port Programes

Port and the Pier was the Trigger point of Zhou Tui Zui District. It creates a Self-Sustainable programs network in the Past.



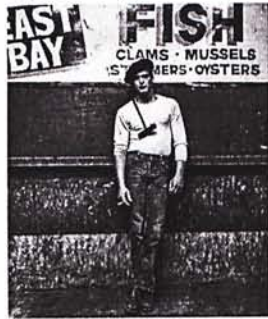
History

Port

Types

Buildings

Case 1: South Street Sea Port, NY, USA



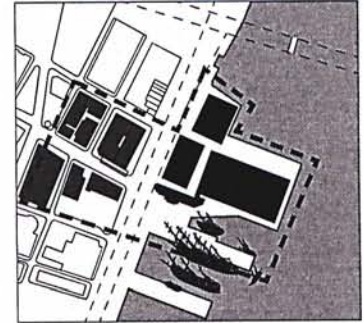
Fish Market



Historical ship



Reclaimed Pier



Case 2: Cranville Island, Vancouver, Canada



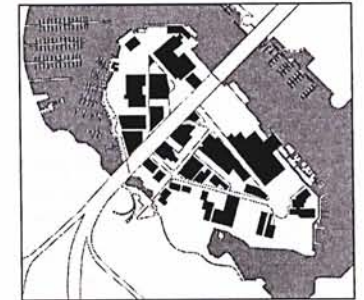
Warehouses



Markets



Reclaimed Island



Site AREA

Site AREA

52,319 sqm.

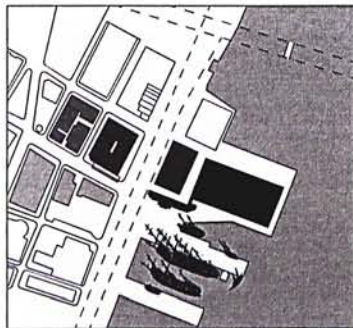
Existing Building Area

20,890 sqm.

Built Area

20,890 sqm.

Programme Distribution



Pier

Market

Plaza

Maritime
Center

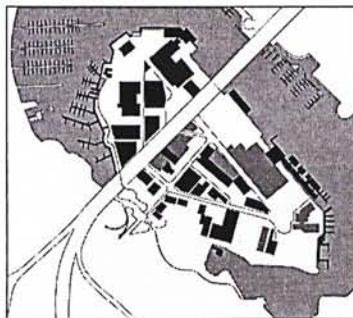
Historical Ship

Programme types

1. Titanic Memorial
2. Cannon's Walk Block
3. One Seaport Plaza
4. Sechermerhorn Row
5. Fulton Market
6. Fulton Fish Market
7. Pier 17 Pavilion
8. Peck Slip Trompe l'œil Jasepr Ward House
9. Ticket Kiosk
10. Maritime Crafts Center
11. Historical Ship

Site AREA

1,714,000 sqm.



Market

Gallery

Pier

Events

Entertainment

1. Shops and Galleries
- Net Loft
- Railspur alley District
2. Entertainment
3. Open space for Events
4. Food
- Public Market
- Fish Market
5. Kids
6. Service
7. Community
8. Industry

3.3.1 Peak Hours: Programme Mapping of Zhou Tou Zui

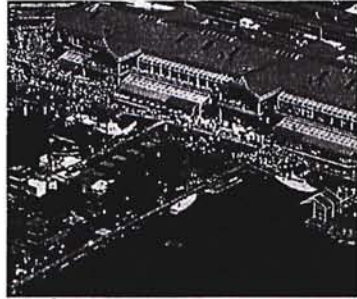
History

Port

Types

Buildings

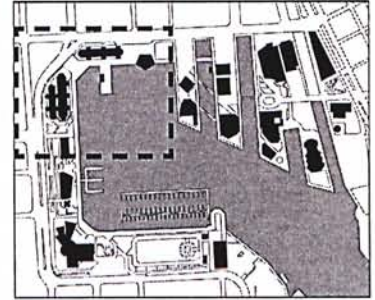
Case 3: Baltimore, Maryland, USA



Trading



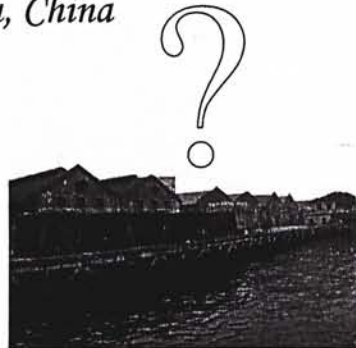
Inner Harbor



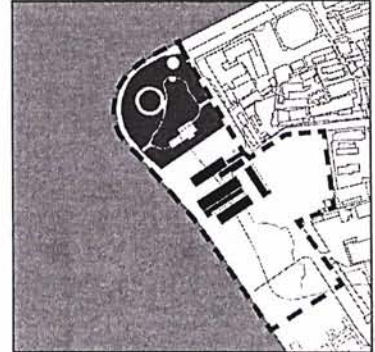
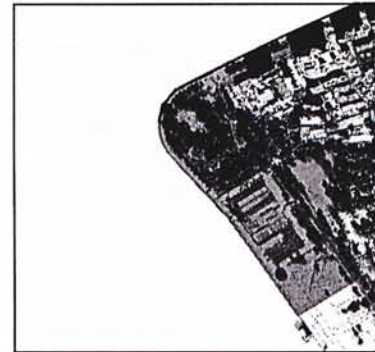
Site: Zhou Tou Zui, Guangzhou, China



Trading



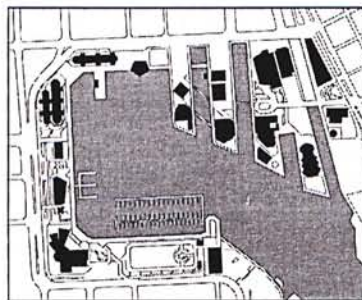
Port Redevelopment



Site AREA

Marketplace Built Area
16,000 sqm.

Programme



Pier
Market
Plaza
Office
Maritime
Center

Programme

1. Pier
 2. Shops and Galleries
 3. Open space for Events
 4. Food
- Public Market
Fish Market

Site Area

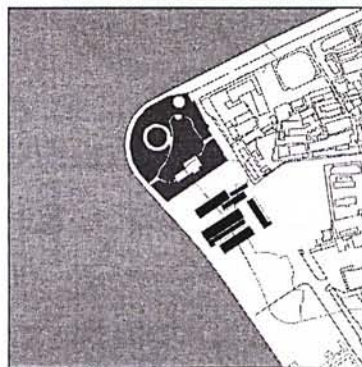
62,065sqm.

Existing Park

18,033sqm.

Existing warehouse

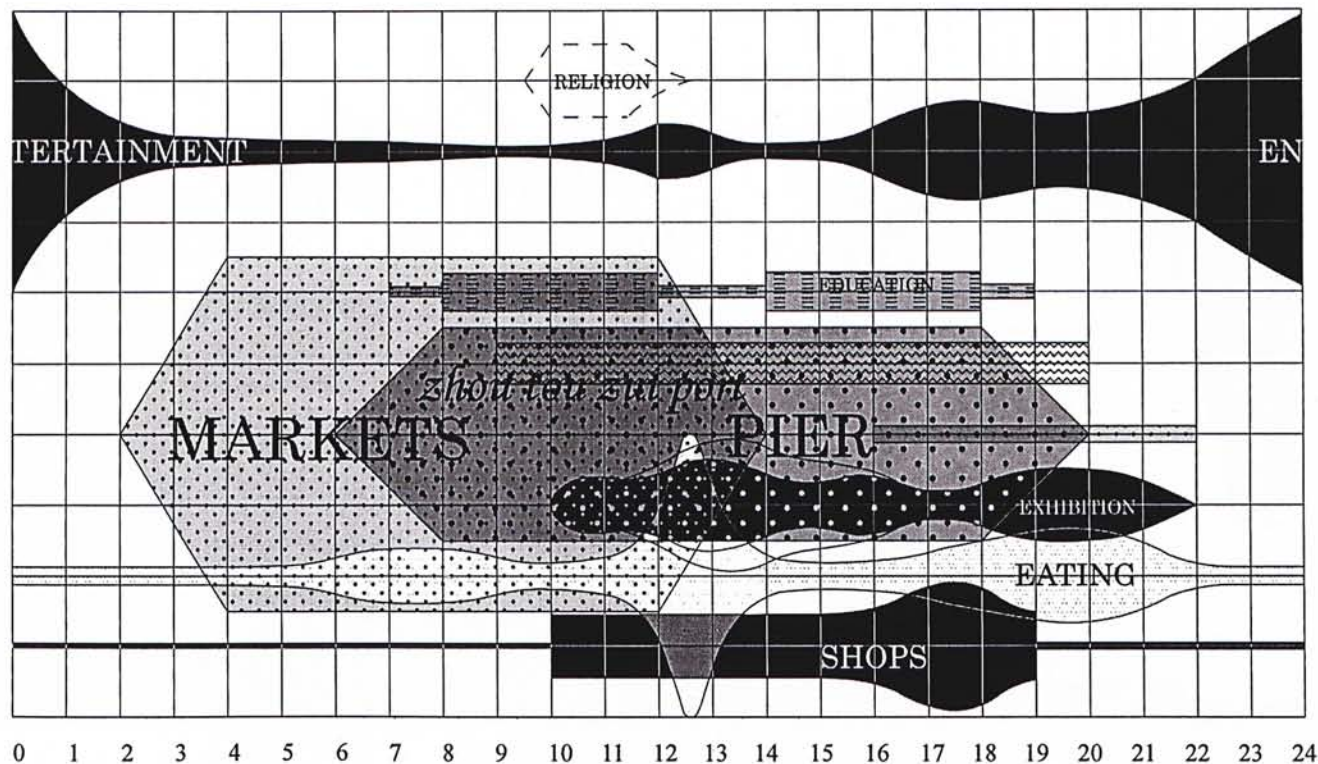
4,164sqm.



Pier
Market
Park
Maritime
Center
Historical Ship

1. Pier
 2. Shops and Galleries
 3. Open space for Events
 4. Food
- Public Market
Fish Market
5. Service
 6. Community
 7. Industry

3.3.1 Peak Hours: Programme Mapping of Zhou Tou Zui



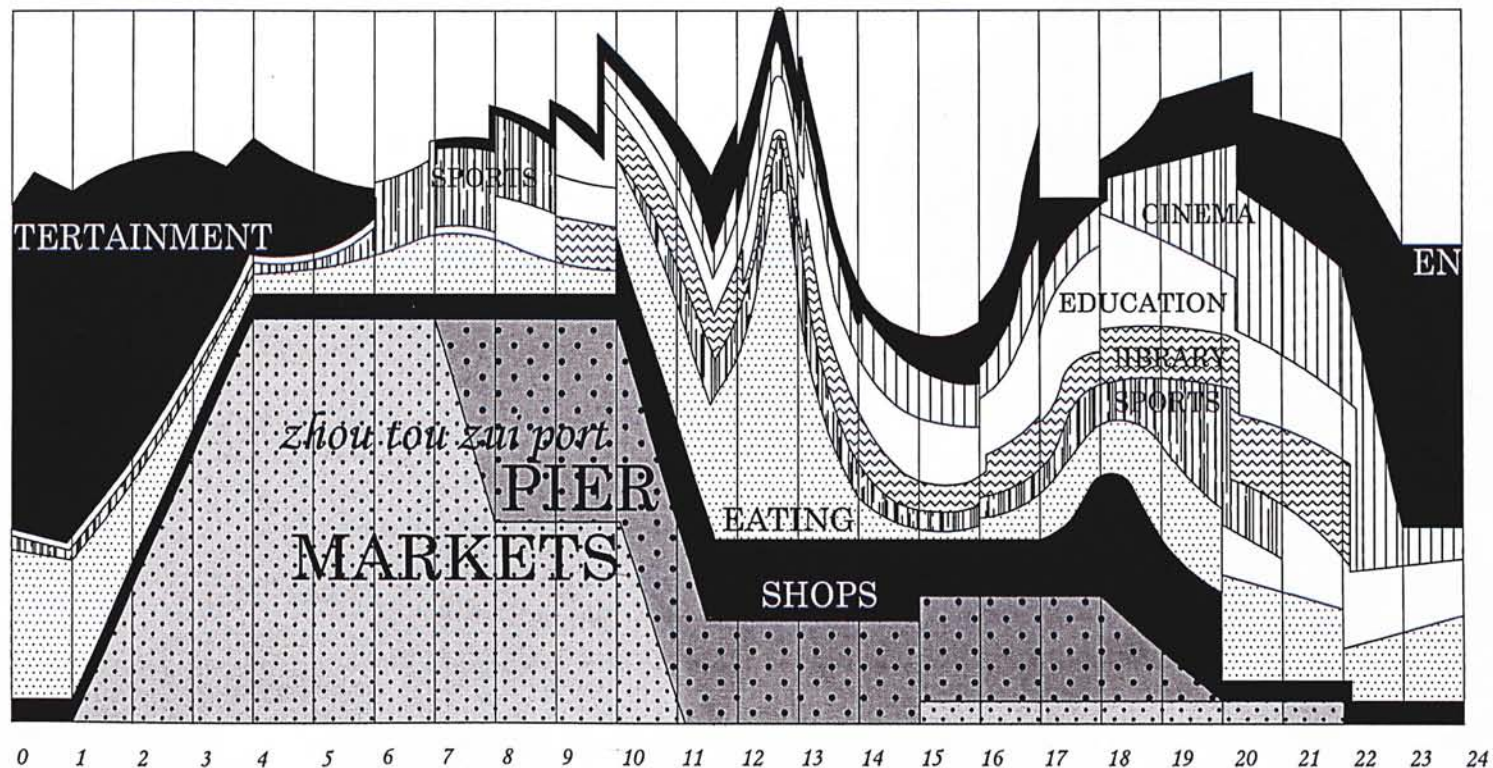
New Zhou Tou Zui Port

- Market
- Pier
- Education
- Exhibition
- Shops
- Eating
- Religion
- Entertainment

3.3.2 24 Market and Pier and A trigger point

New Zhou Tou Zui Port

Market
Pier
Education
Exhibition
Shops
Eating
Religion
Entertainment



Programme Mix

11,000sqm.

MARKET	
	Food Market
	Second Hand Market
	Resturaunt
	Pier
	Staff
	Fish Market
	Custom office
	Wharf

4,164 sqm.

PIER Terminal	
	Exhibition
	Store
	Pier Waiting
	Staff

5,000 sqm.

EDUCATION	
	Naritime Museum
	Auditorium
	Comunity Centre
	Archive

5,000 sqm.

LOFT	
	Artist Studio
	Gallery
	Staff

ACCOMMODATION

3000 sqm.

Hostal



Site Area: 62,065 sqm.

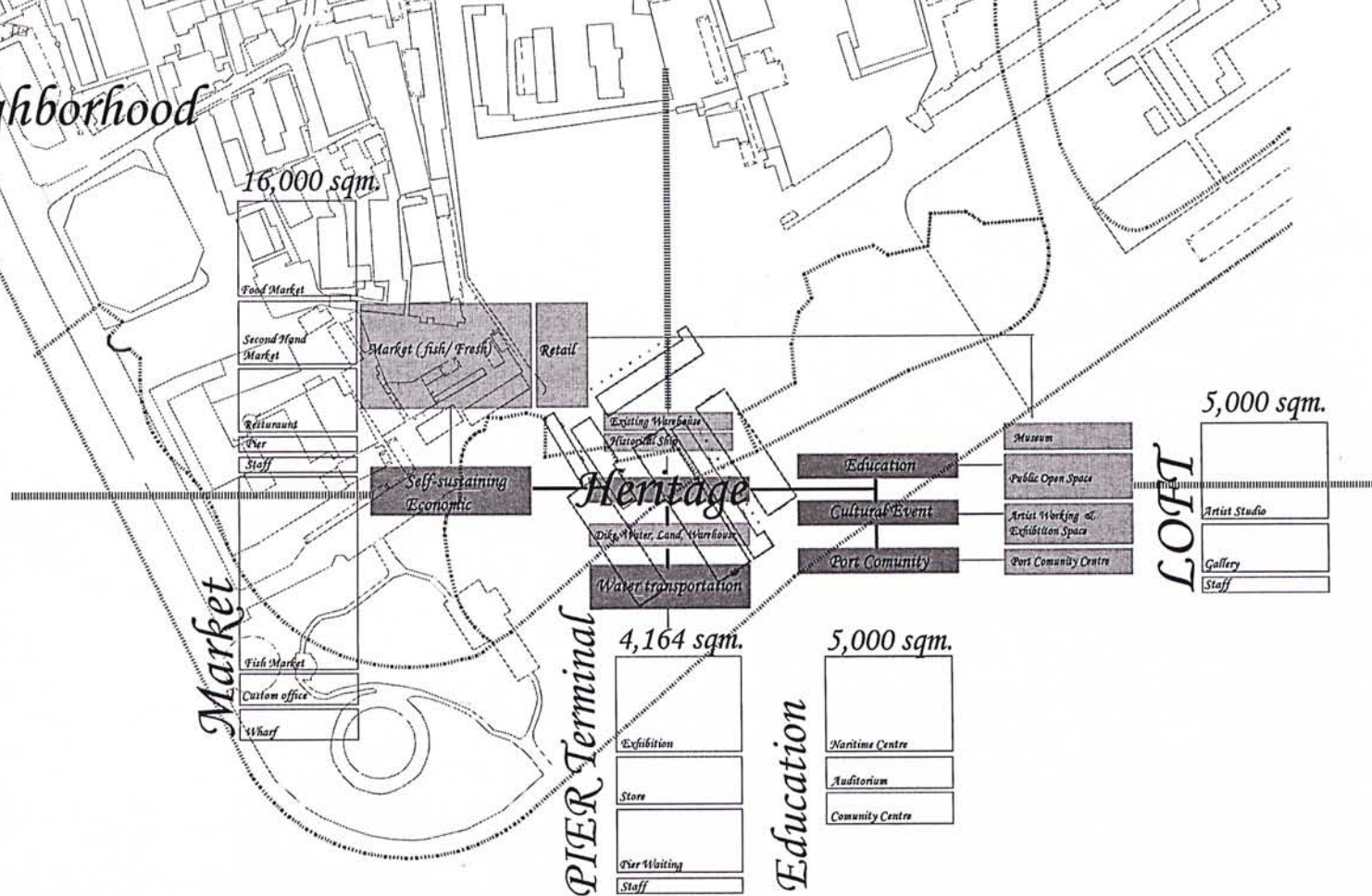
Water: Canal 10,706 sqm.

Plot ratio: 0.65

Contribution to Neighborhood

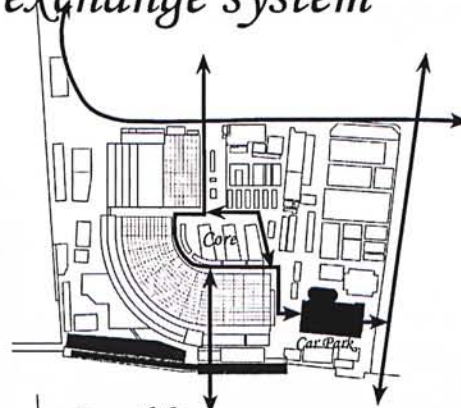
Aims:

1. Re open the Entrance
2. Transportation
3. Economic Self-sustained
4. Public / open space
5. Unique and diverse
6. Community Space
7. Entertainment
8. Preservation
9. Connection





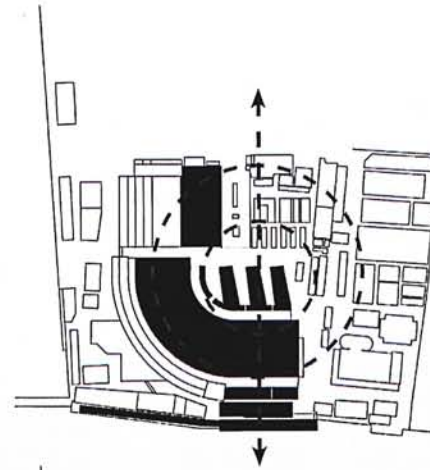
High efficiency Market exchange system



Accessability
Logistic: Water / Land

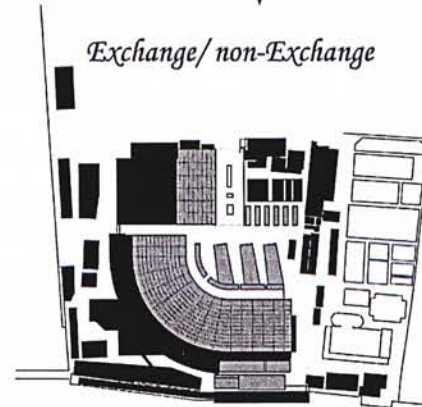


Producer/Consumer



Market Sales space is the centre

Exchange/ non-Exchange



Public / Private

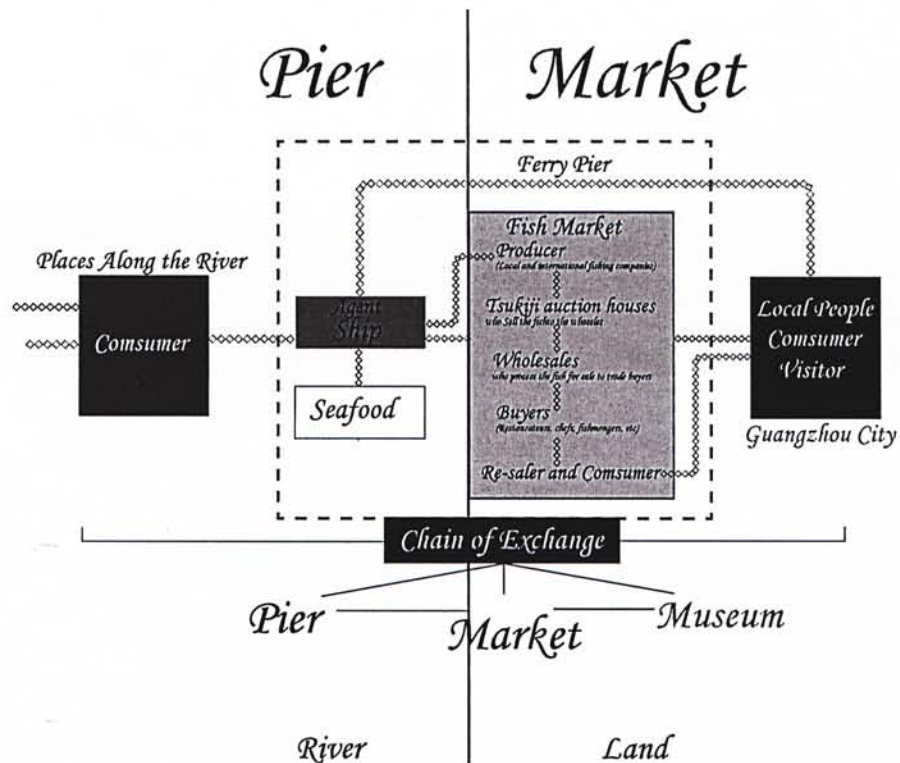
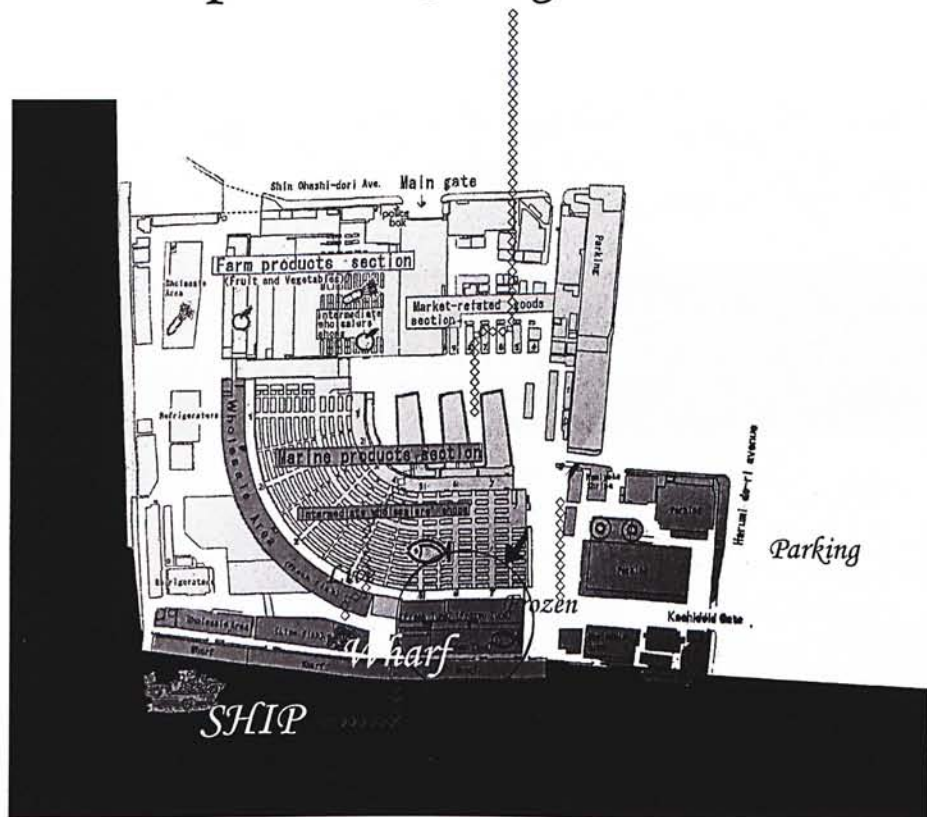
Public

Wholesale Area
Indoor Market Sales Area
Outdoor Market Sales Area
Fruit Market Area
Restaurants
Shops
Car Park

Private

Ships
Wharf
Wharf Loading/unloading Area
Cold Storage
Aquatic Product company office Area
Security Check Point

3.3.3 Spatial Exchange: Product and People



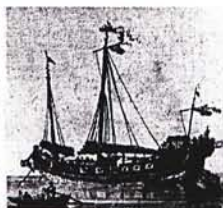
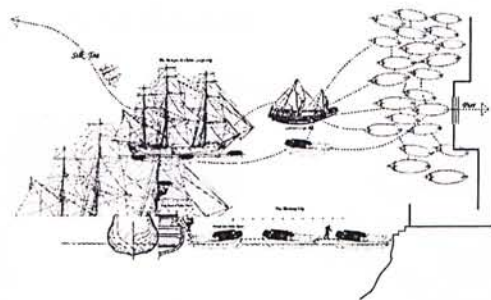
Special Study:

Amphibious Transformation

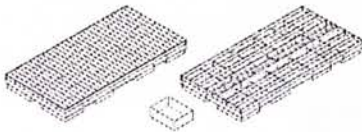
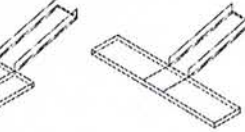
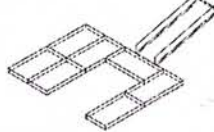
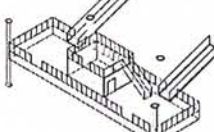
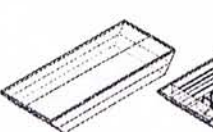
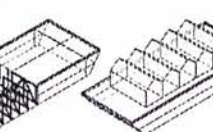
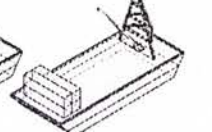

The issue of 'floating architecture' is yet to be explored in Guangzhou (canton), this region where lots of populations were coming from. In the fore coming years of rising sea-level, how are we going to address this?

To understand the mechanism and possibility of this special study, architecture can be offered another dimension where the concept of 'immobilia' can be 'im-mobilia'. In fact, around the world, the poetry of the floating architecture is common in areas where water plays an important role to define the city edges and amphibious habitats. From the history and observation of the current port in Guangzhou (Canton), the Floating and movable transformation of 'Ship – Barge – Floating dock – Bridge – Dock yard (building)' between land and water is considered as the critical buffer zone of maritime architecture. They offer ways of adjust tidal changes and spatial combinations, which result an ever-changing city edge.

Existing Floating Structure



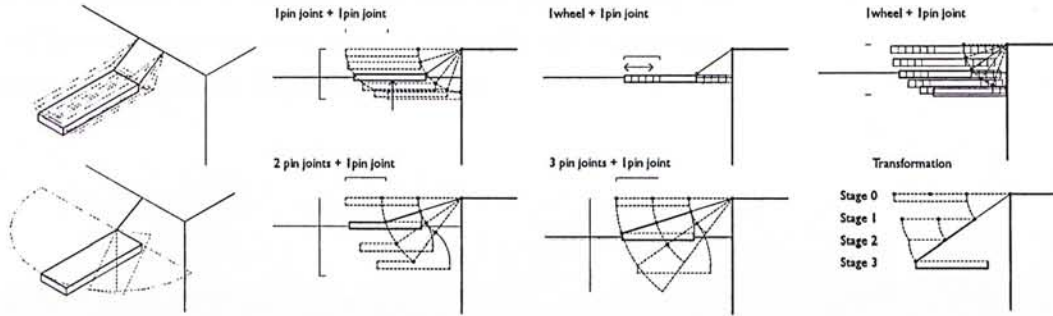
Existing Floating Structure

Floating City	Ship	Bosts	Private Living	Public space
				
				
Floating material	Floating Docks for boat	Variations	Floating Docks for ferry	Barge
			Truss	Floating Building
				Auto Barge

Floating Mechanism

Mechanism

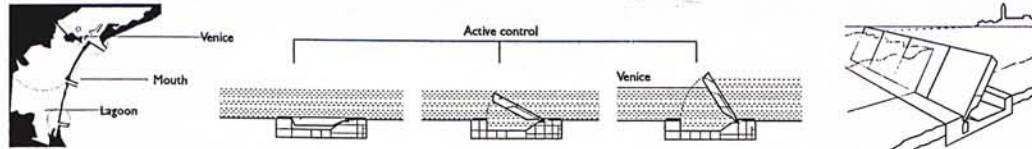
- Passive Tidal Change



- Active Control Tidal Change

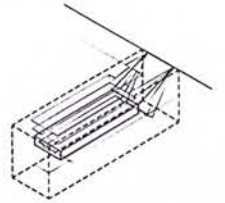
- Active Control

Case study : MOSE Project , Venice, Italy

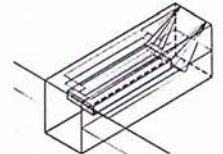


Possible Spacial Transformation

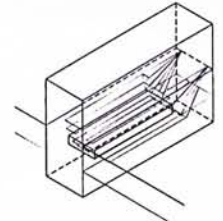
1. Imagining the water level can be control inside the box in dotted line



2. Carve out the land, to create a container for water control,

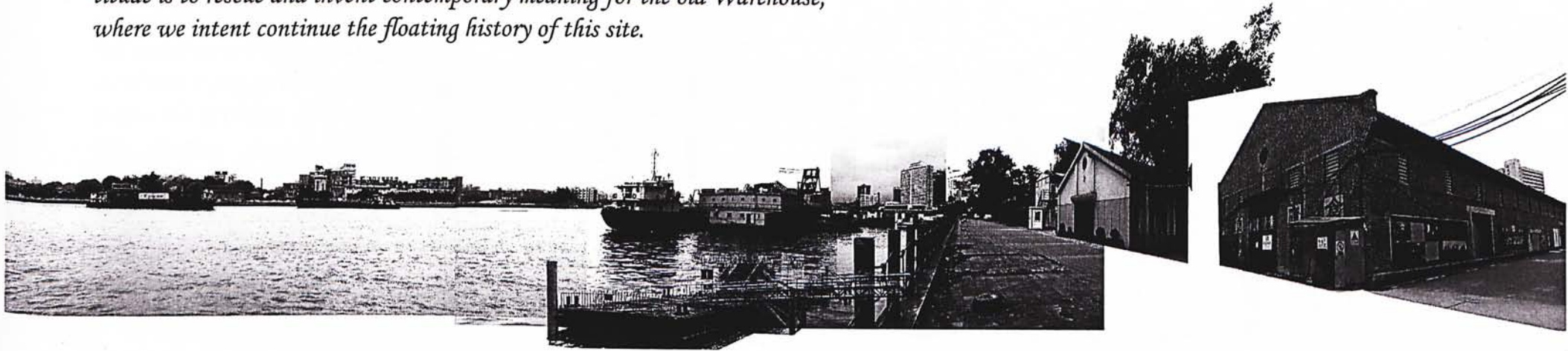


3. Create enclosure sub define space inside a building by tidal control



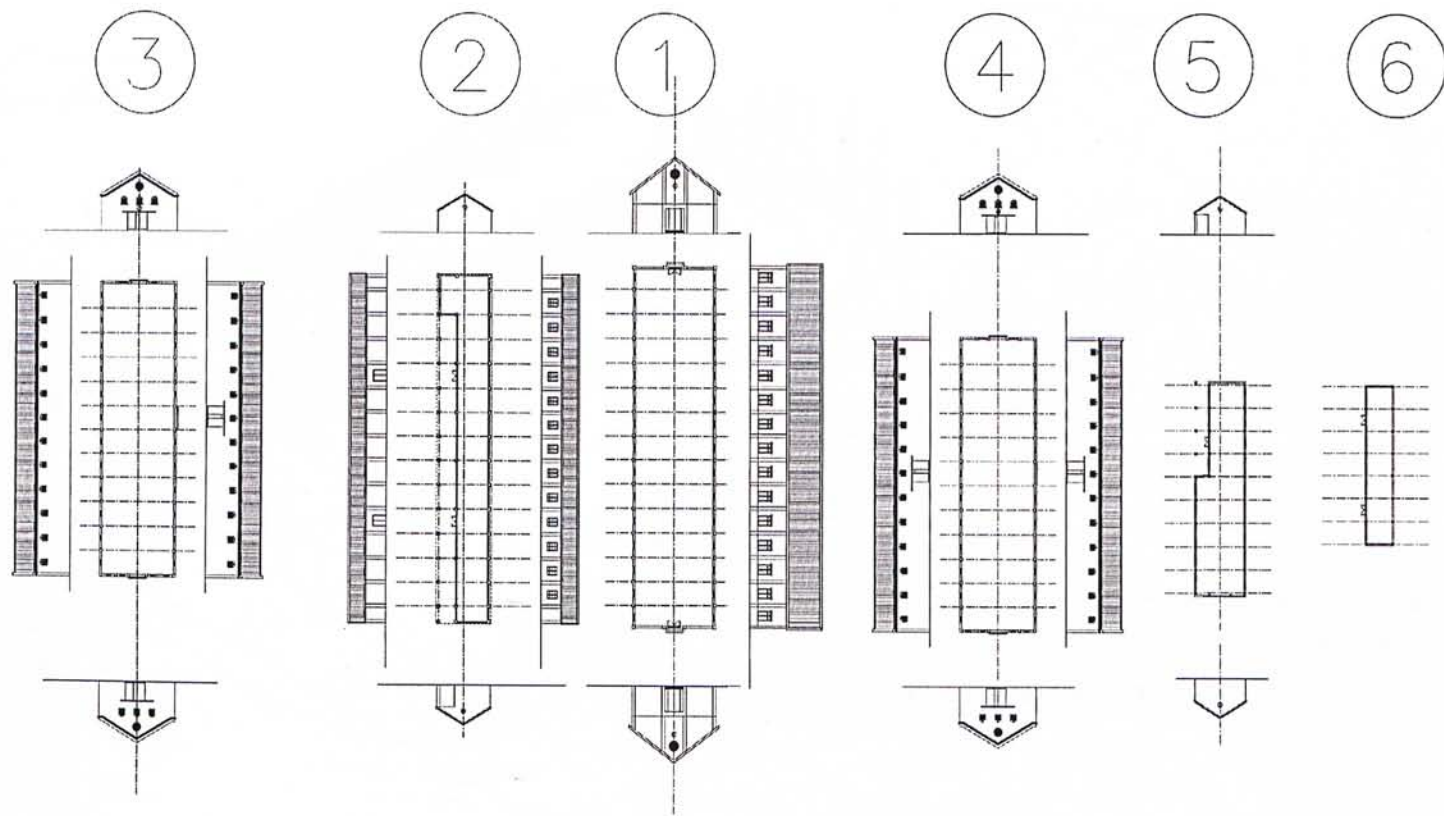
Hisotrical Waterfront Warehouse

The Site has 7 historical warehouses, which I decided to preserve. The attitude is to rescue and invent contemporary meaning for the old Warehouse, where we intent continue the floating history of this site.



Existing Warehouse

To introduce the Floating Concept of the dock to the historical warehouse, a new floating structure is pug-in to the land below the Existing structure. The floating structure further sub-define the space inside and under the warehouse. they could accomodate different programmes over time.

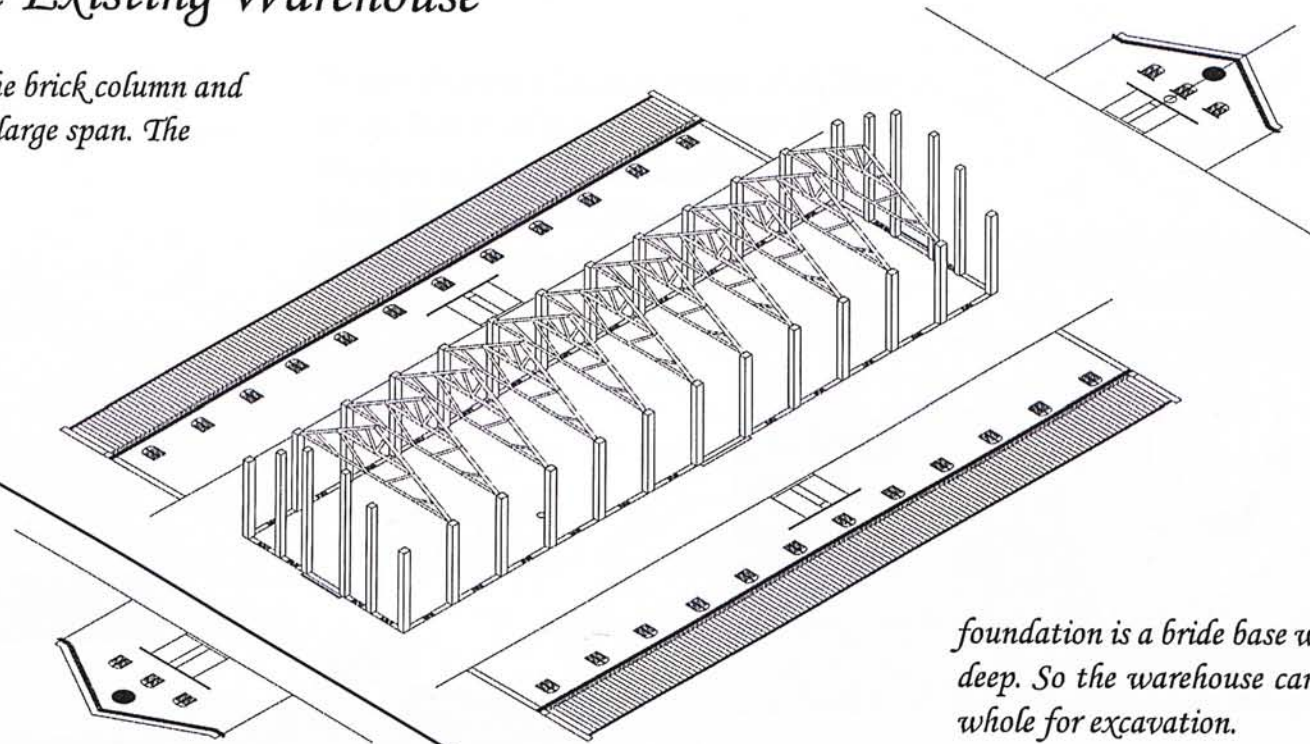


Structure of the Existing Warehouse

All the warehouse are in the brick column and truss structure to create a large span. The

Land

Water

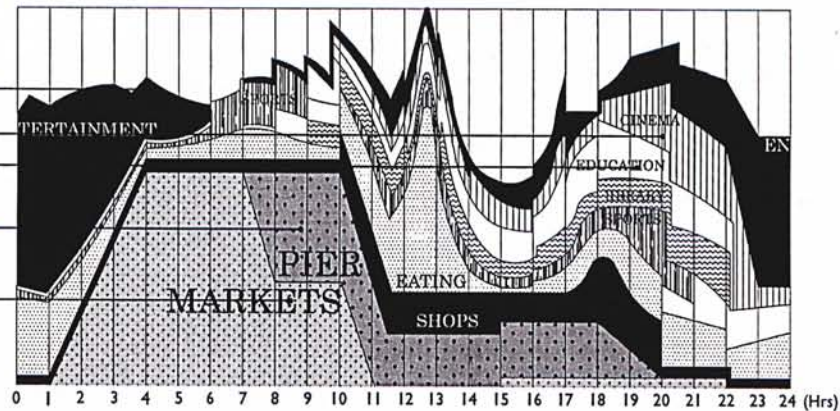
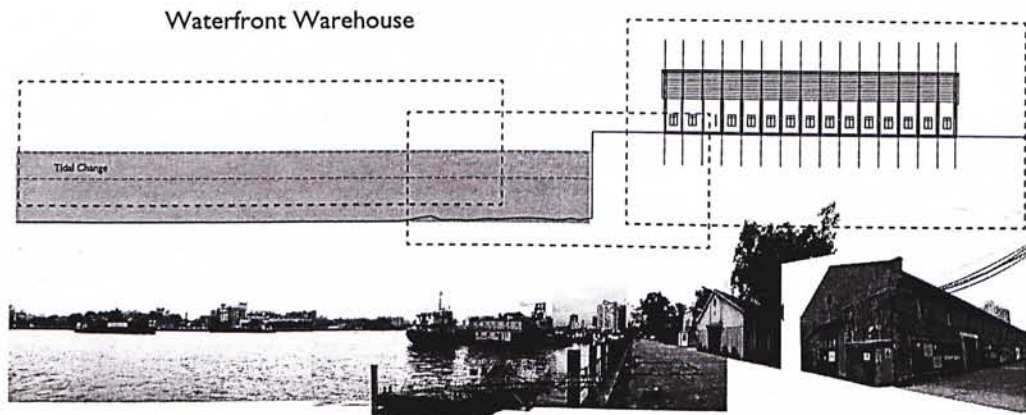


foundation is a wide base which only 500mm deep. So the warehouse can be removed as a whole for excavation.

24 Hour Program in Zhou Tou Zui Port

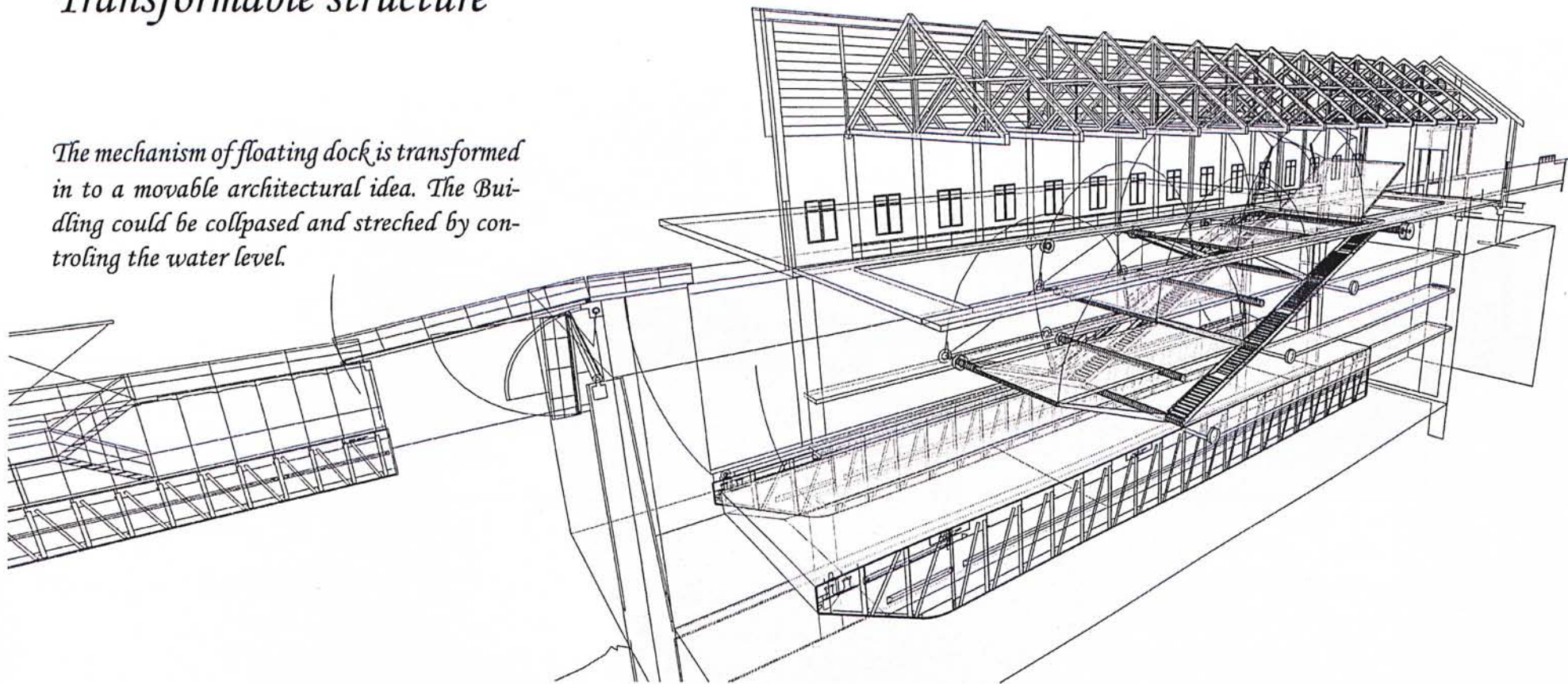
The Floating Structure could link up the Ship and other existing Floating structure and programme on the river.

To introduce the Floating Concept of the dock to the historical warehouse, a new floating structure is pug-in to the land below the Existing structure. The floating structure further sub-define the space inside and under the warehouse. they could accomodate different programmes over time.



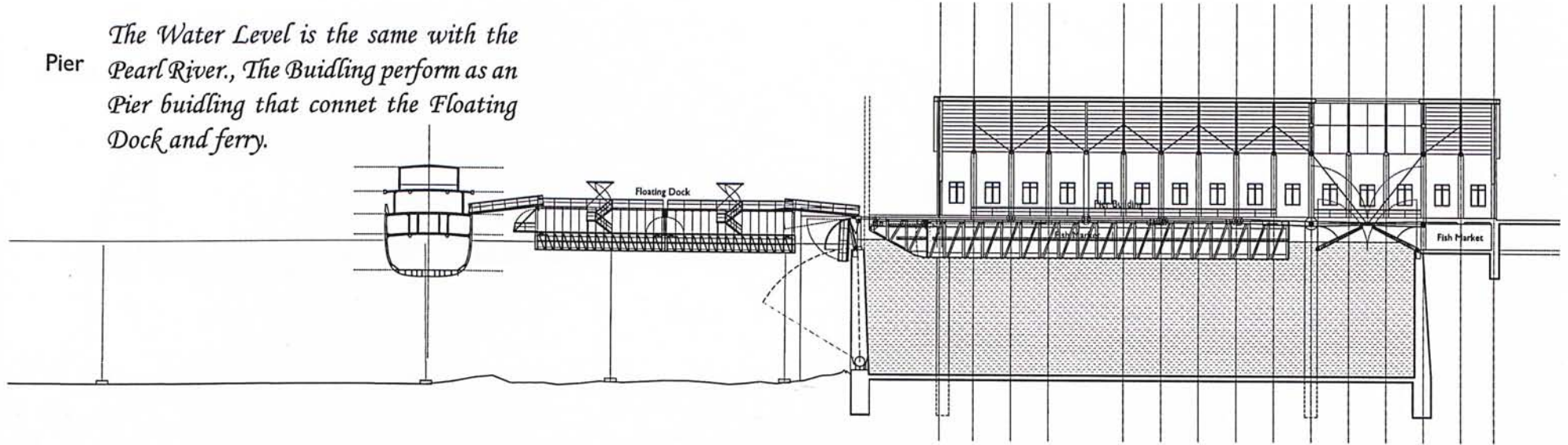
Transformable structure

The mechanism of floating dock is transformed in to a movable architectural idea. The Building could be collapsed and streched by controlling the water level.



Level 1 - Pier Building

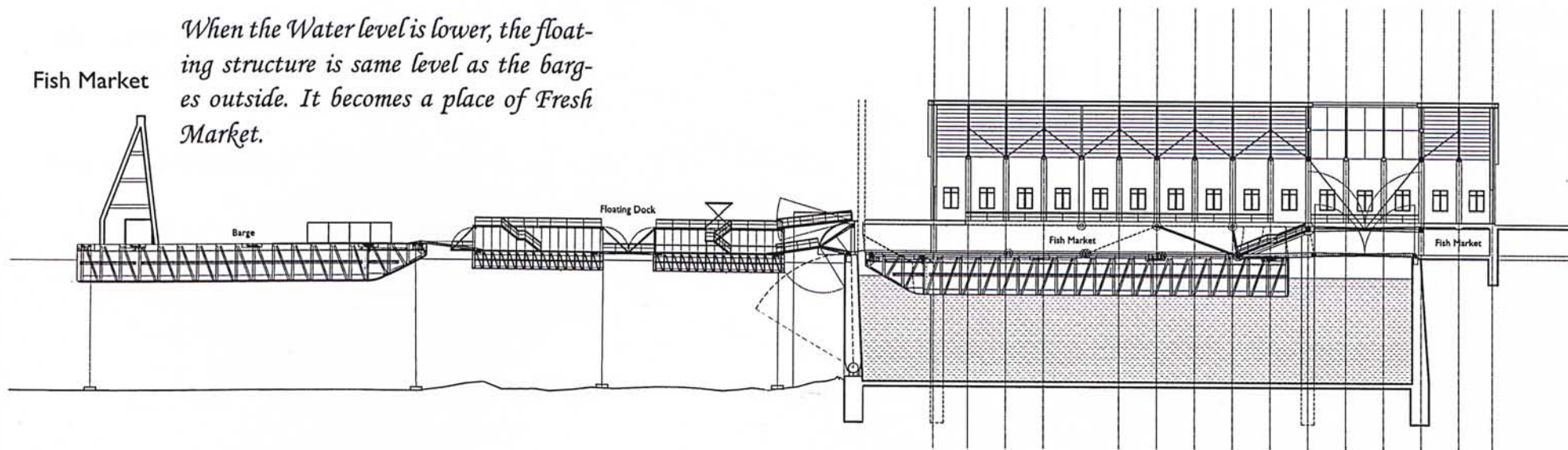
Pier *The Water Level is the same with the Pearl River., The Buidling perform as an Pier buidling that connet the Floating Dock and ferry.*



Level 2 - Public Market (Fresh Market)

Fish Market

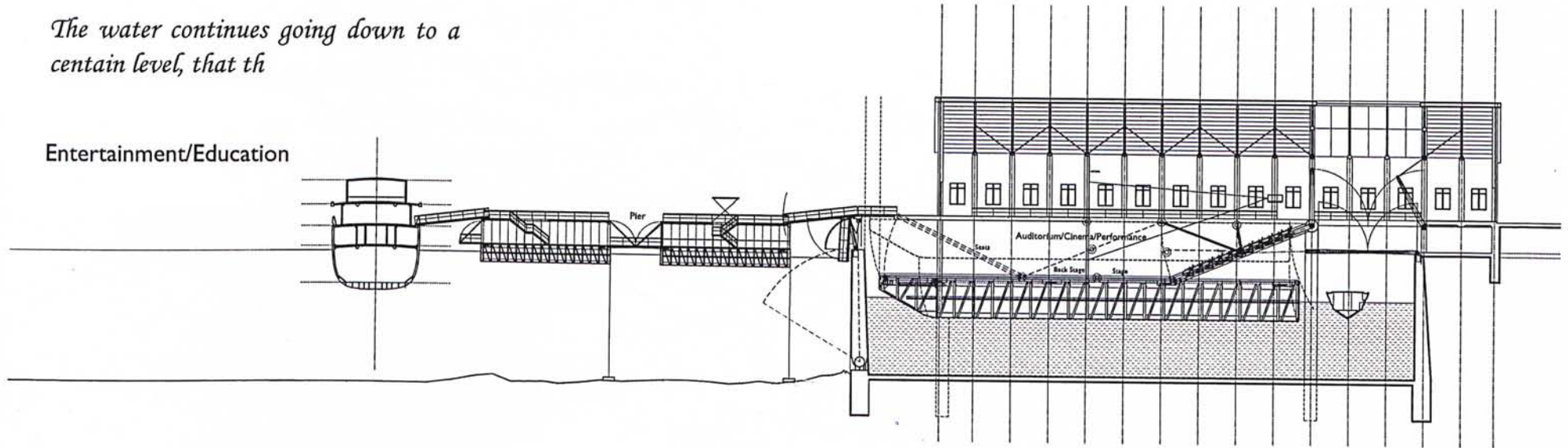
When the Water level is lower, the floating structure is same level as the barges outside. It becomes a place of Fresh Market.



Level 3 - Space of Performance

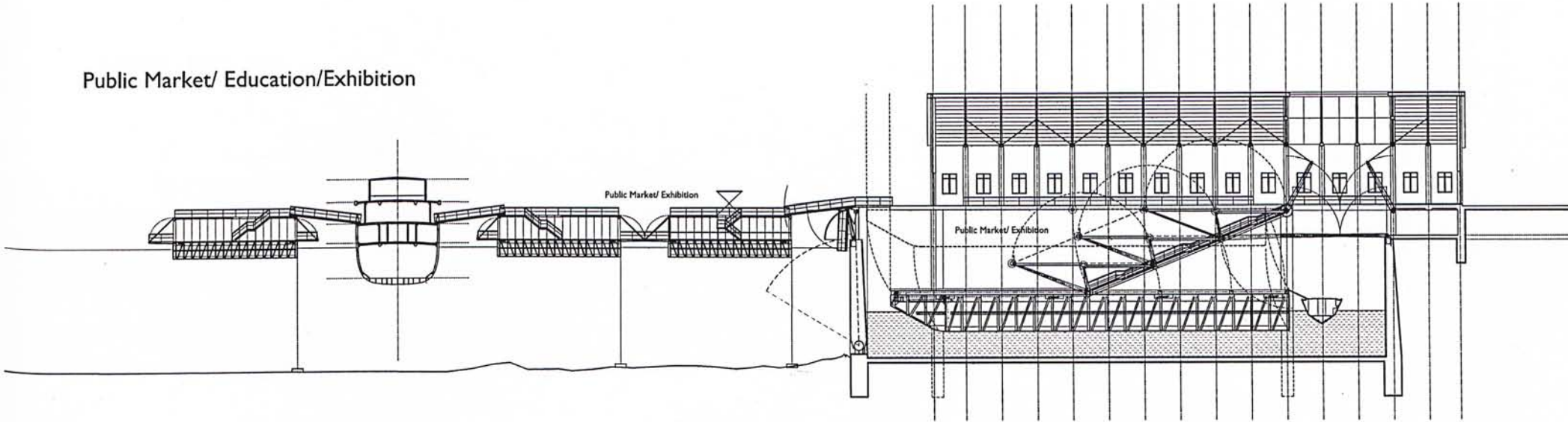
*The water continues going down to a
certain level, that th*

Entertainment/Education



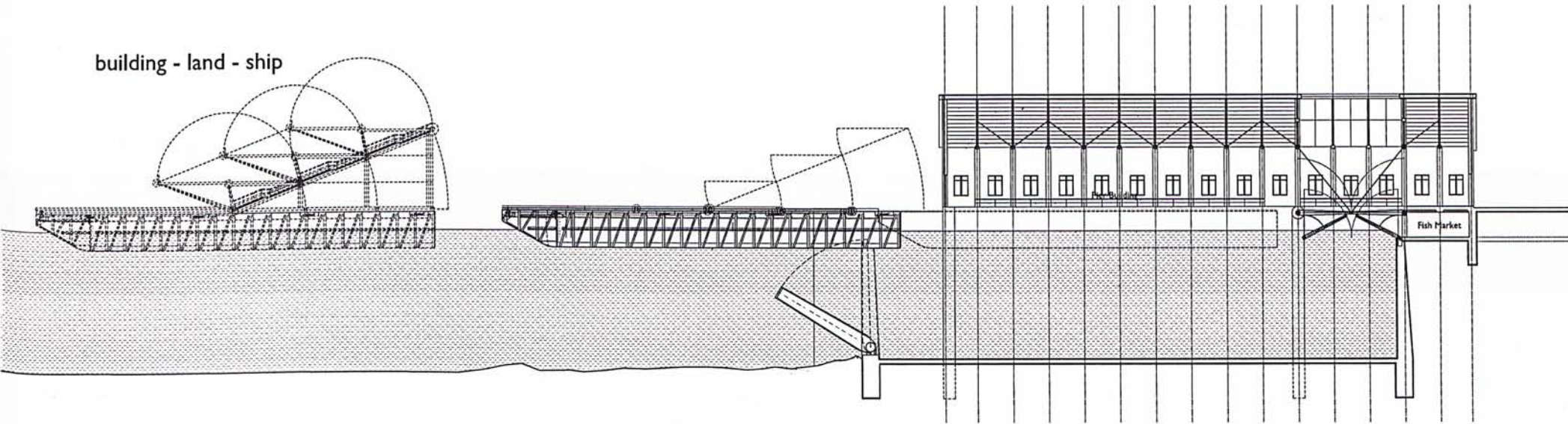
Level 4 - Multi- Storied Building

Public Market/ Education/Exhibition



Level 0 - Ship Depart from the Warehouse

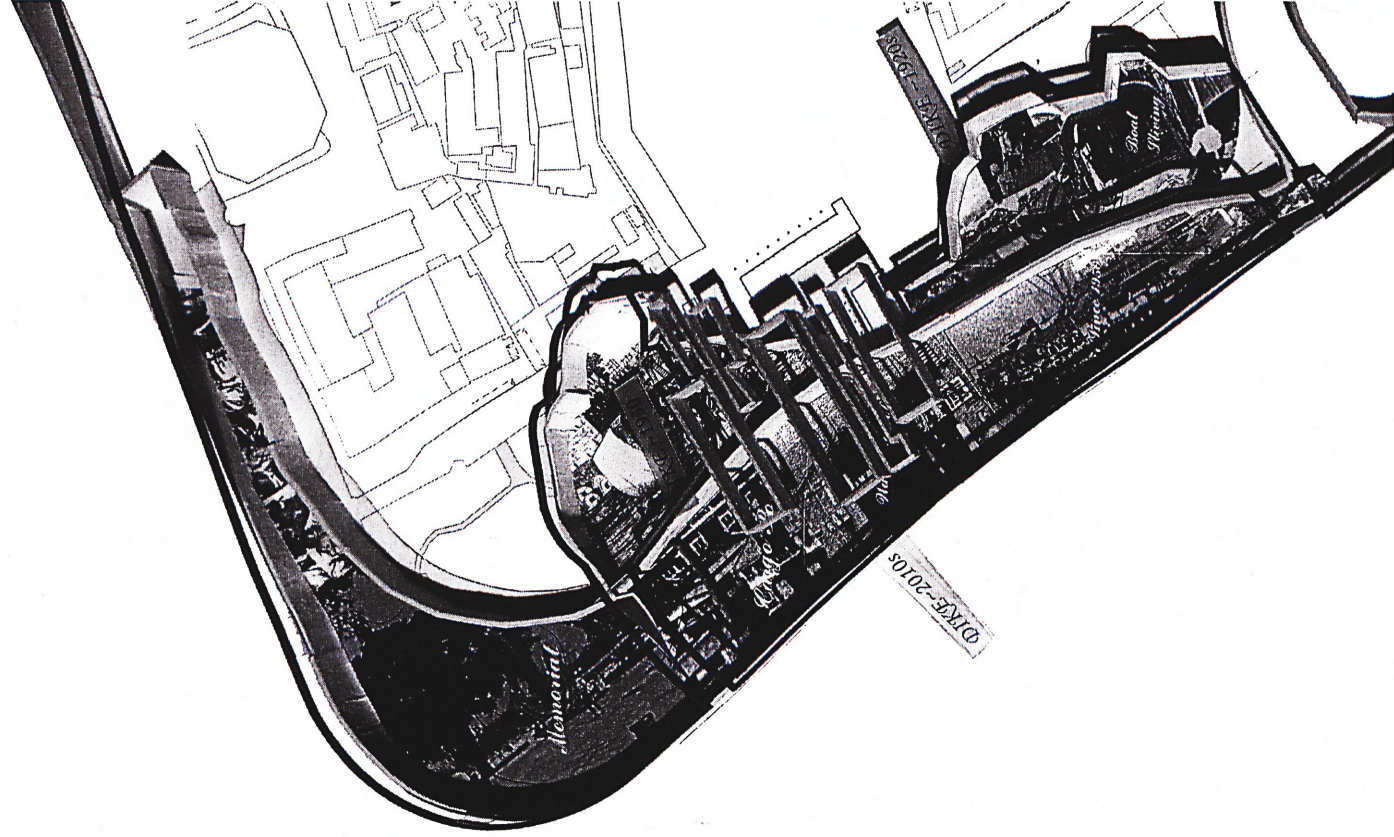
building - land - ship



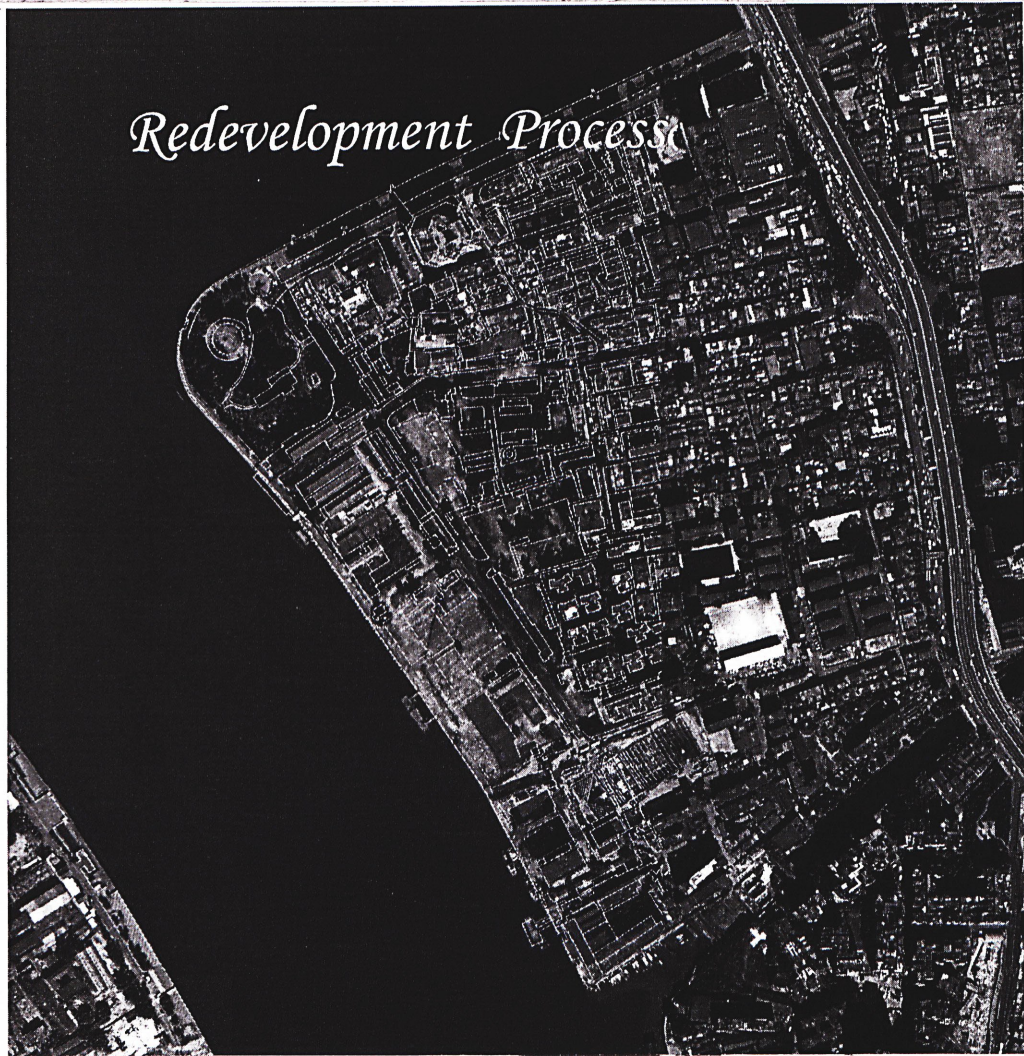
Design Application:

Zhou Tou Zui Port Redevelopment

*Site Partiv Model
Land Restoration Over Years*

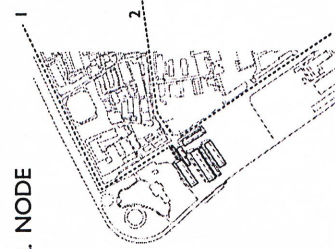


Redevelopment Process

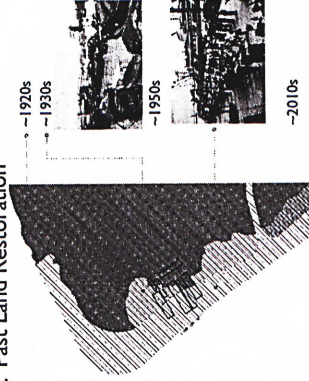


A. NODE

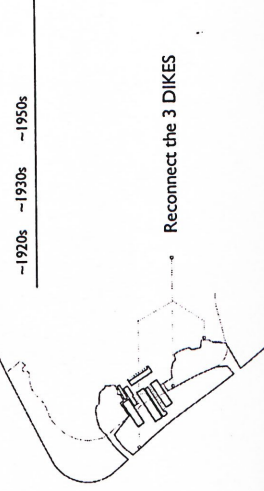
1. Coastal Walkway
2. Shop Houses
3. Existing Factory



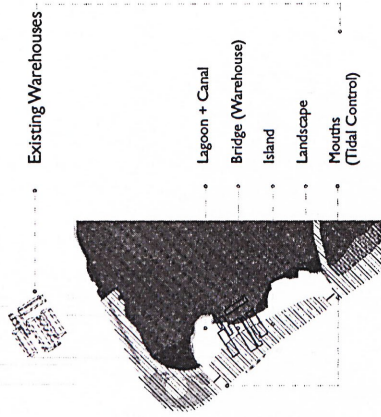
B. Past Land Restoration



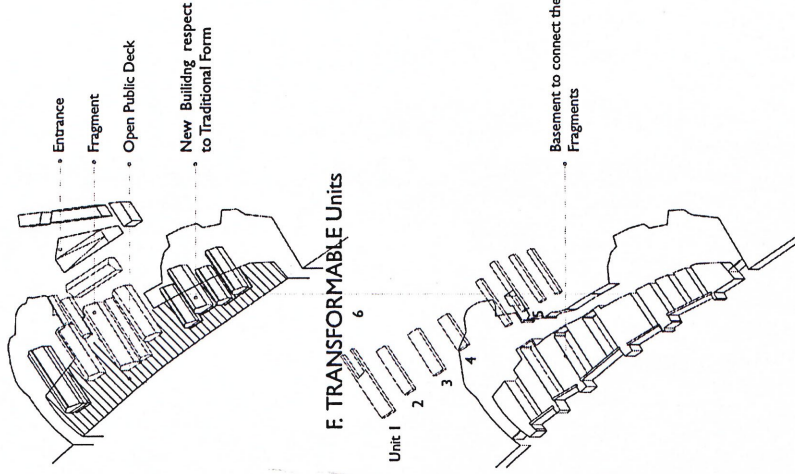
C. NEW Coastal Line



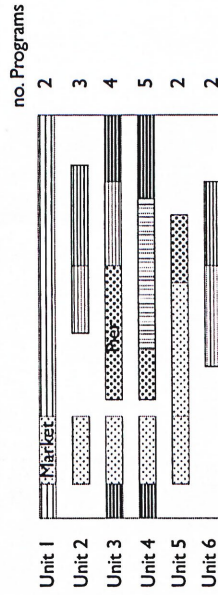
D. RESTORATION OF Land and Water



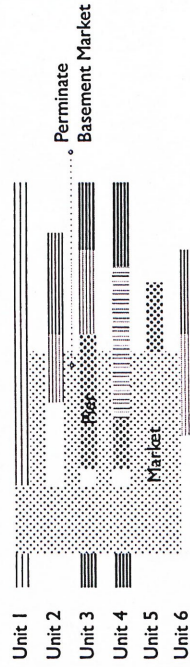
E. OLD and NEW Buildings

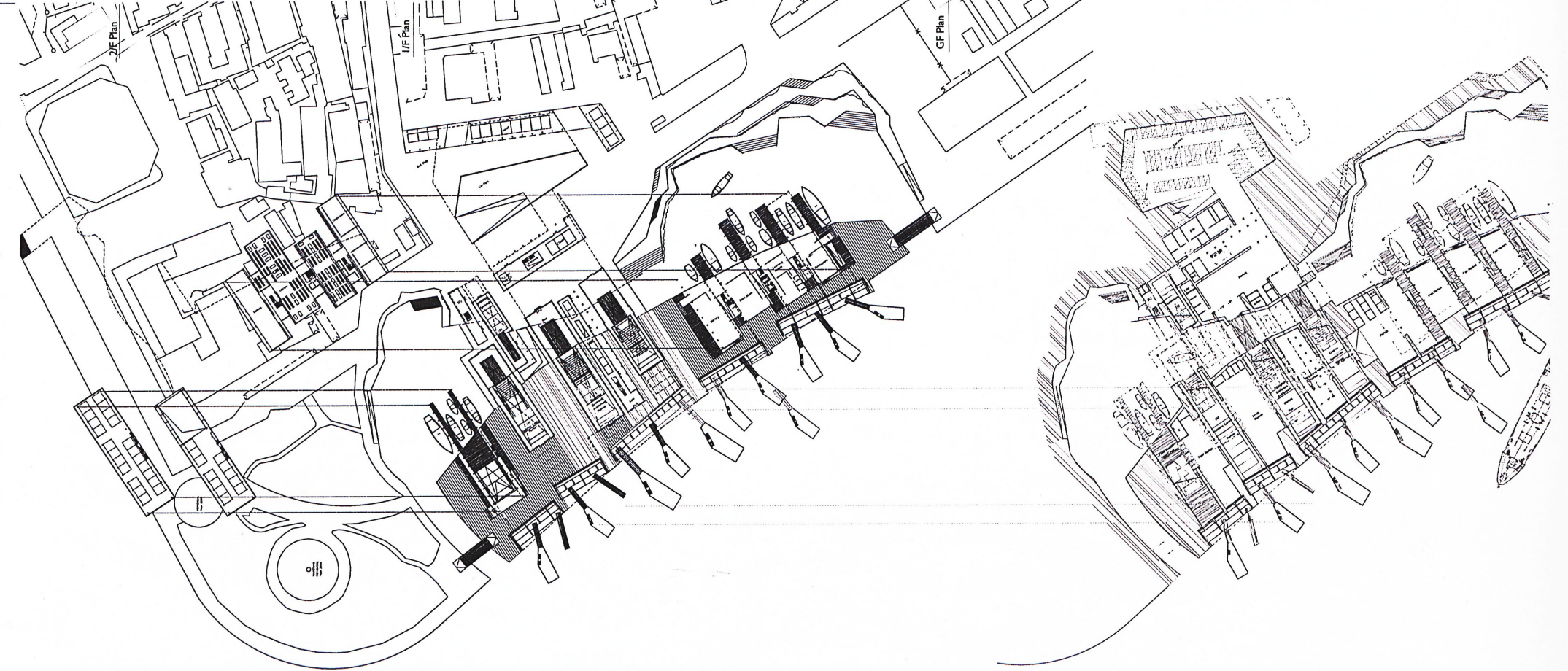


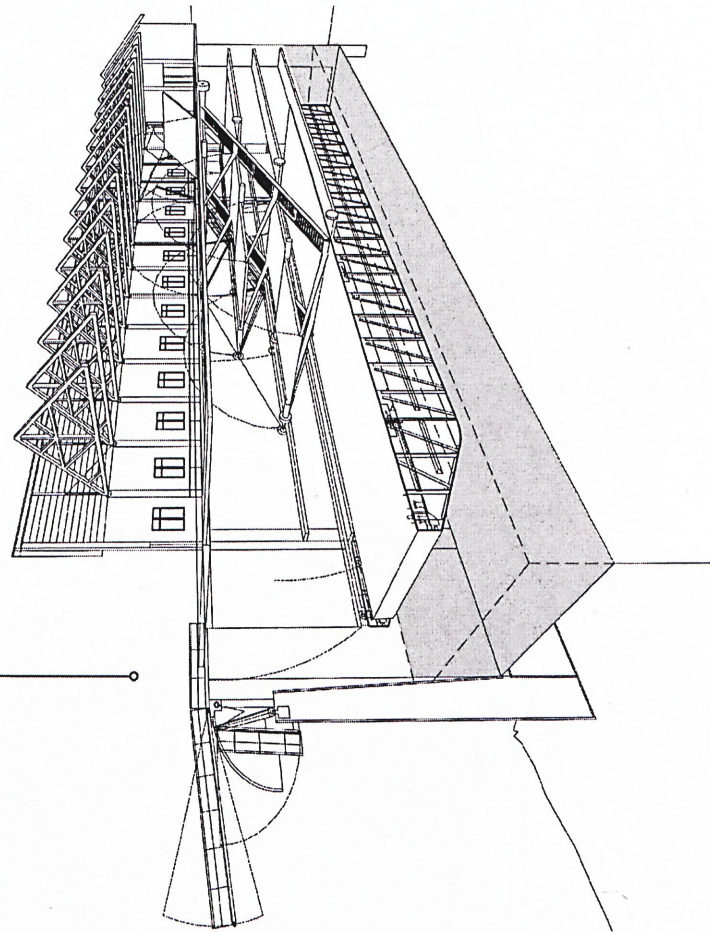
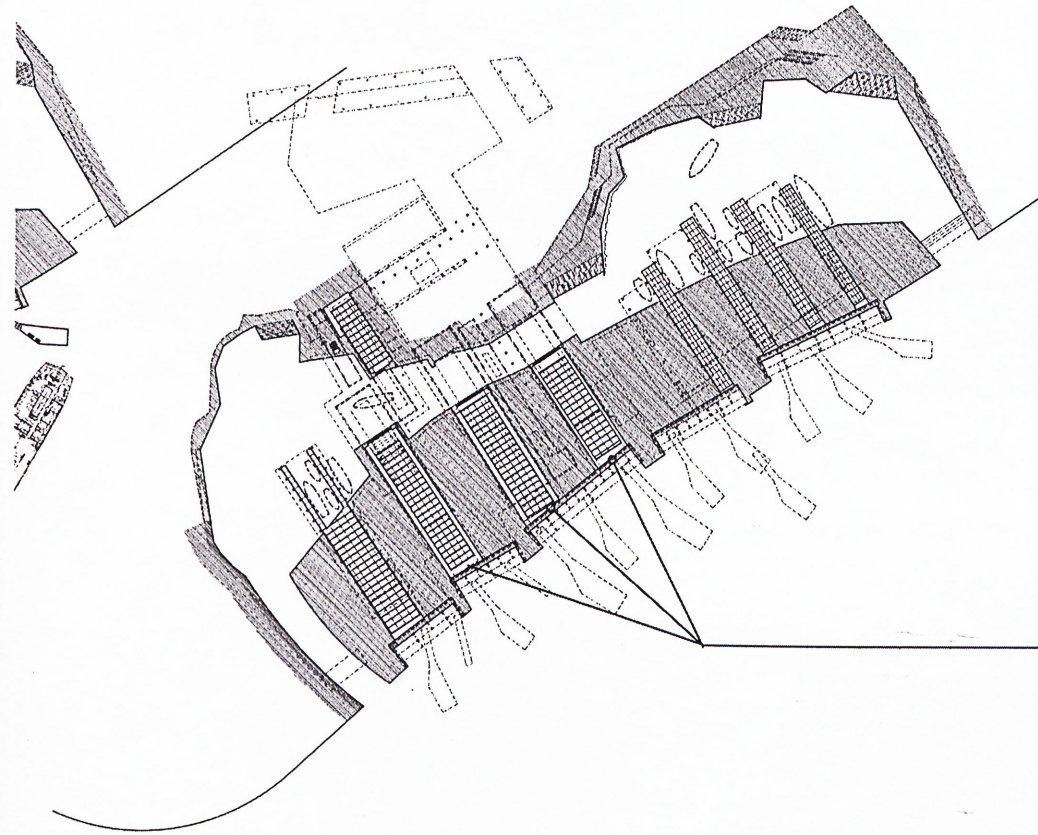
G. Temporary PROGRAM Distribu- tion and Degree of Transformation



Basement + Transformable Units 24 hrs Program Pattern







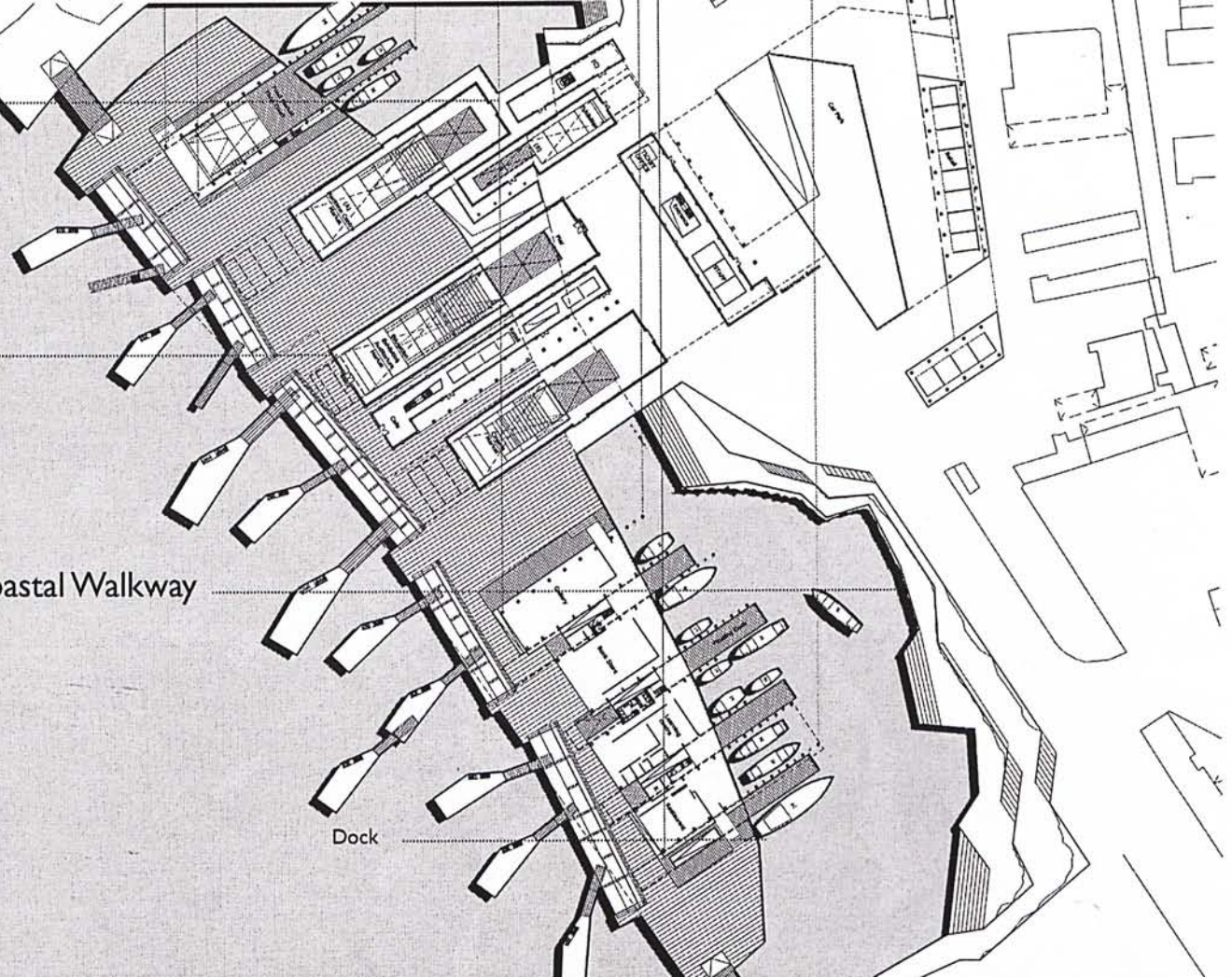
Public Deck

Bridge

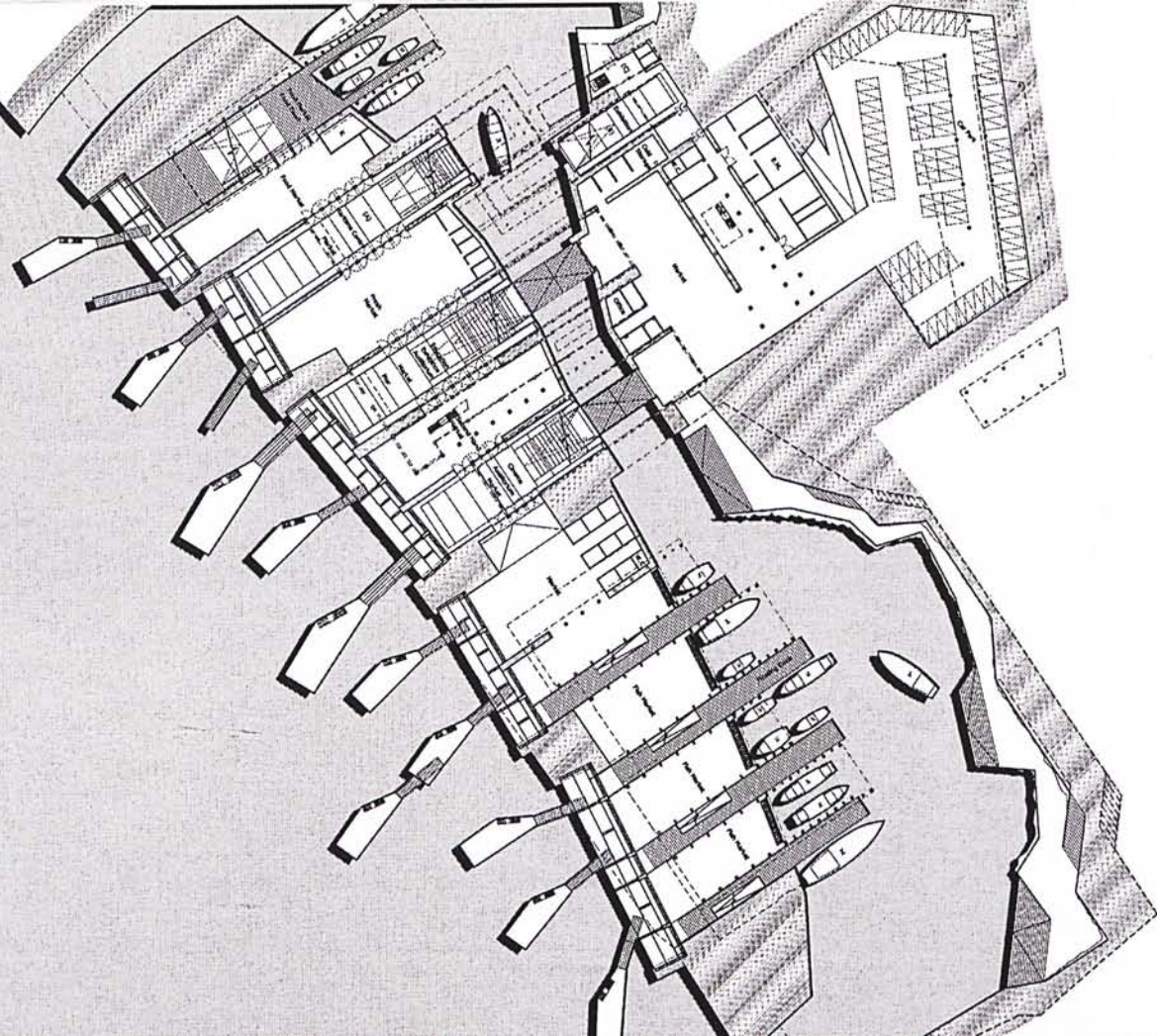
Public Platform

Landscape : Green Coastal Walkway

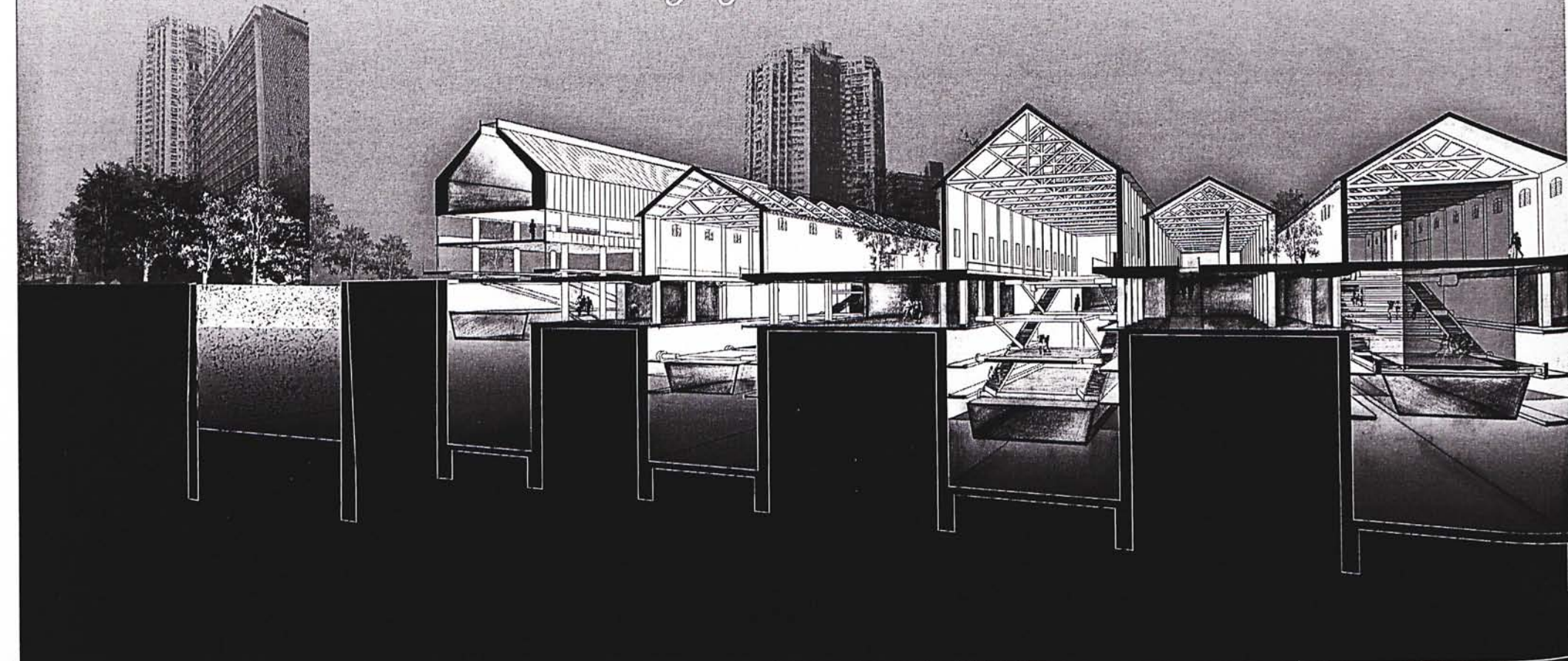
Dock

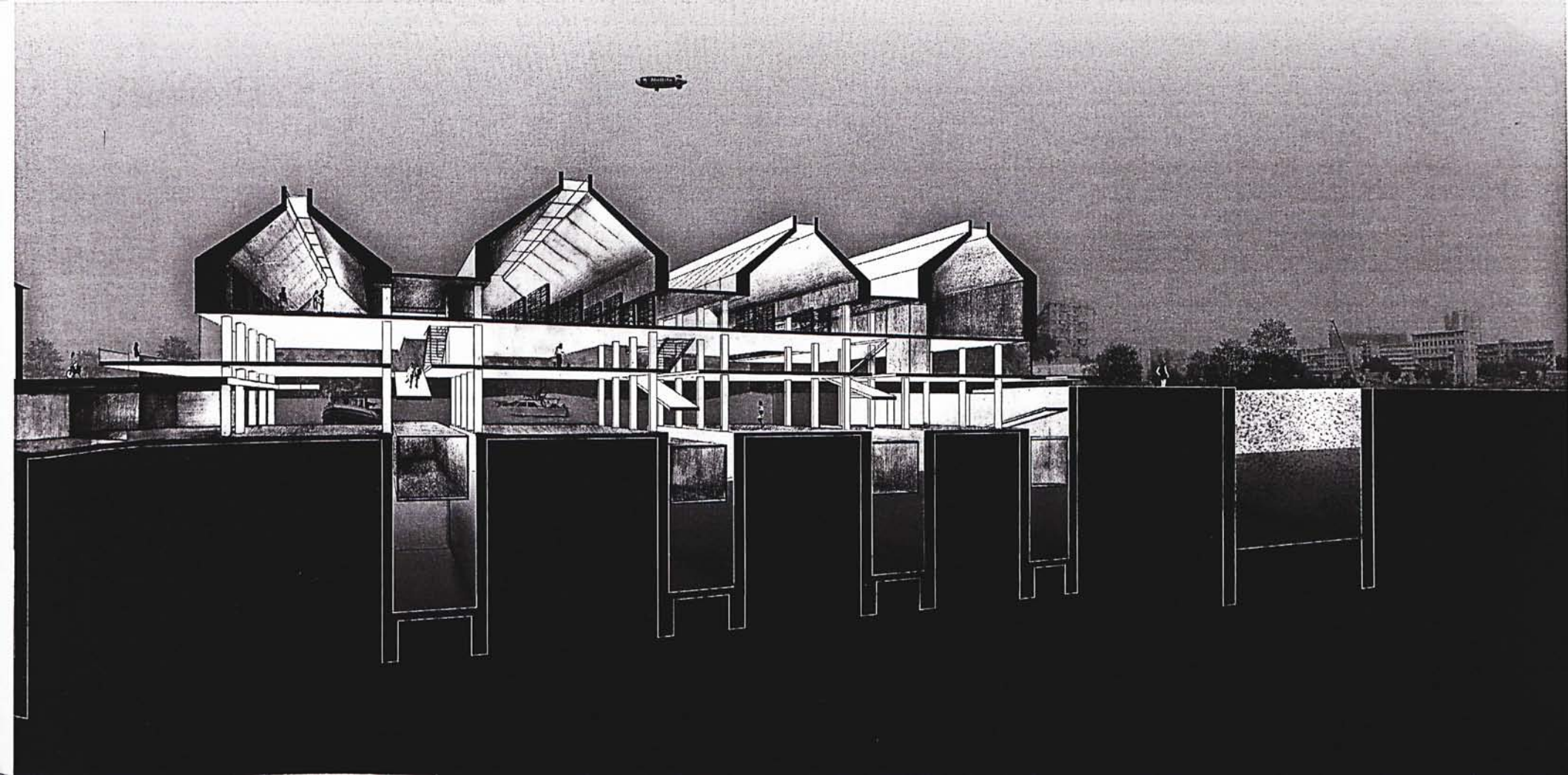


Basement

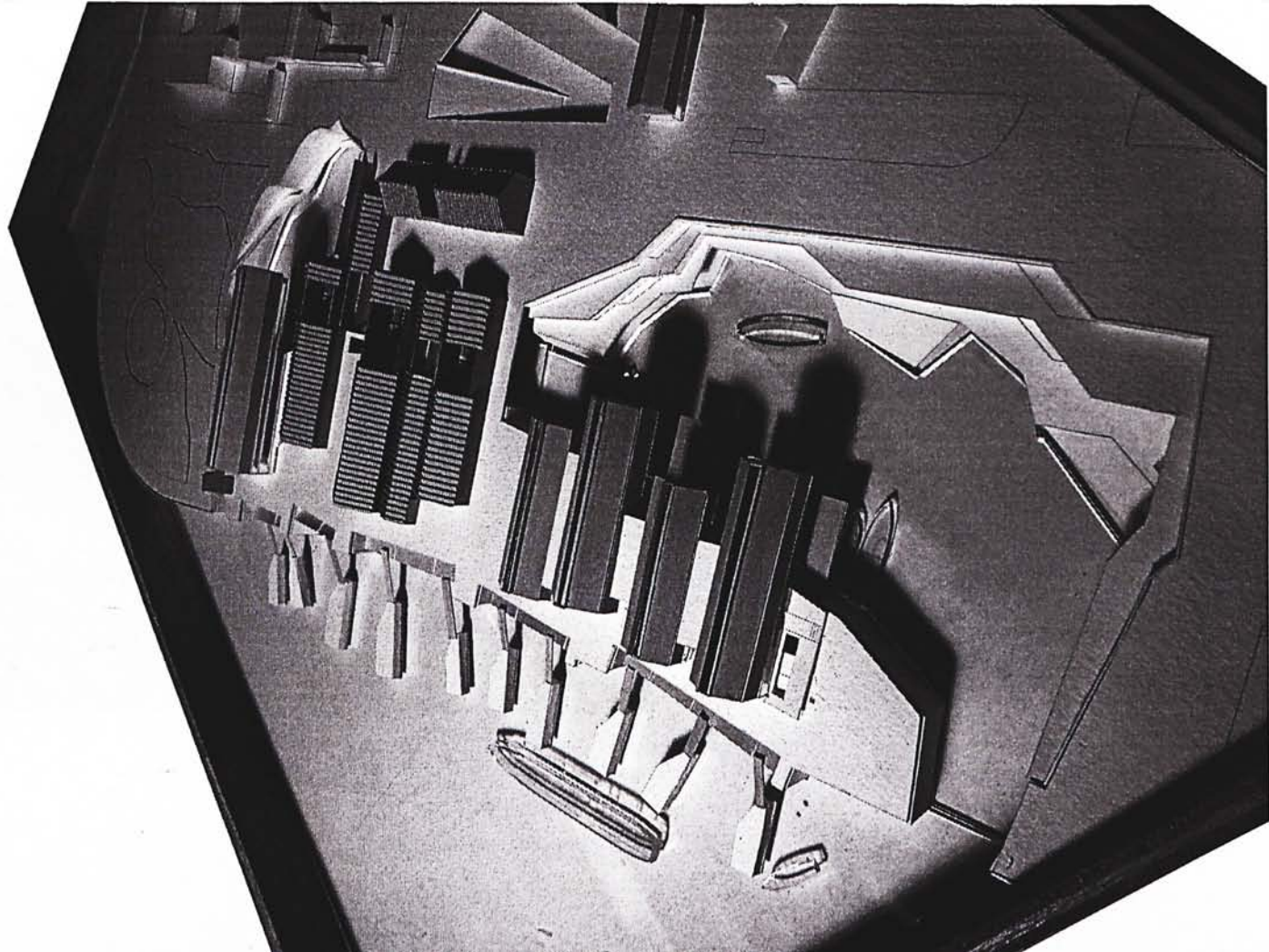


New Zhou Tou Zui: Ever - changing Port

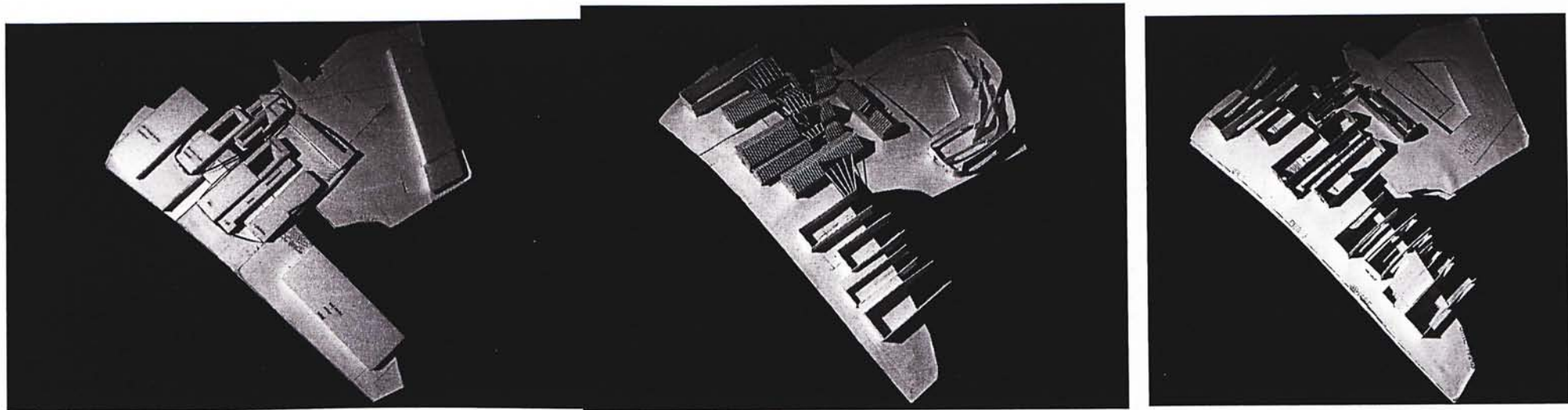


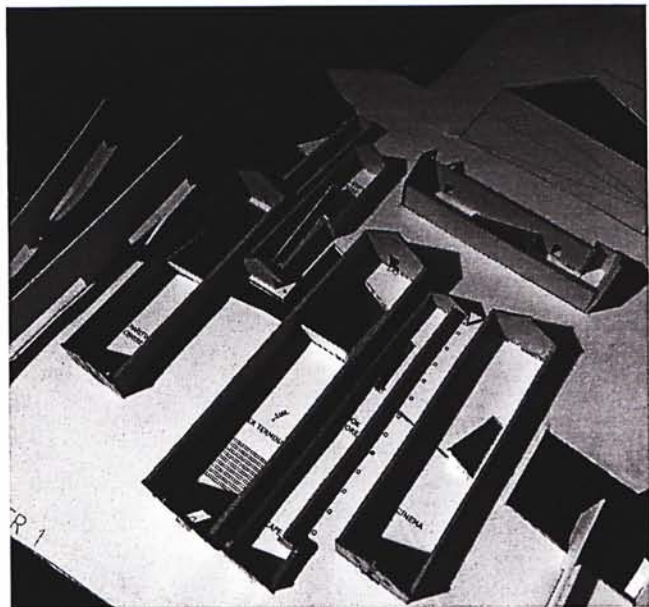
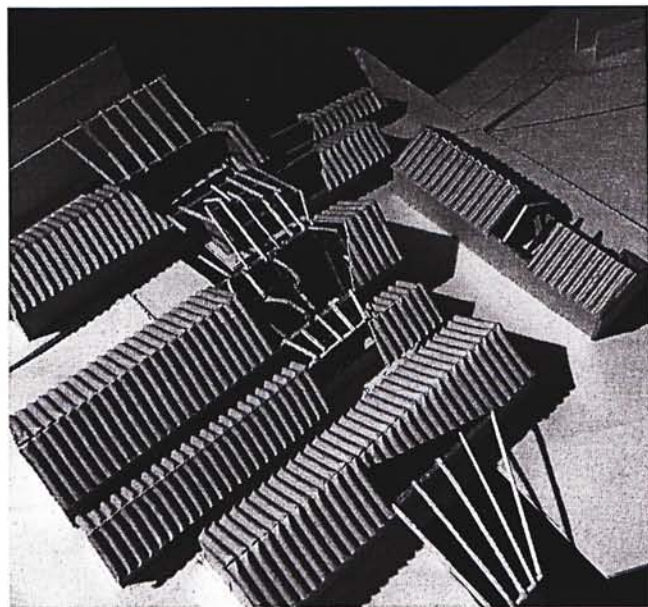


Public Deck

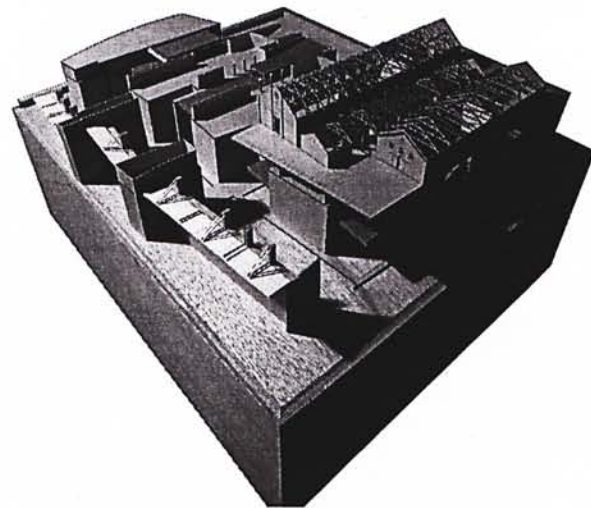
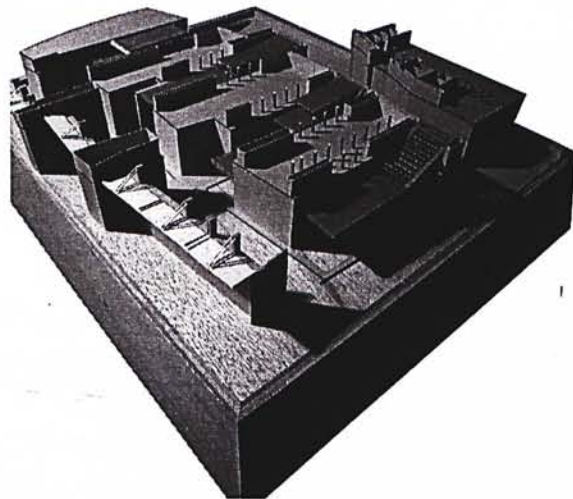
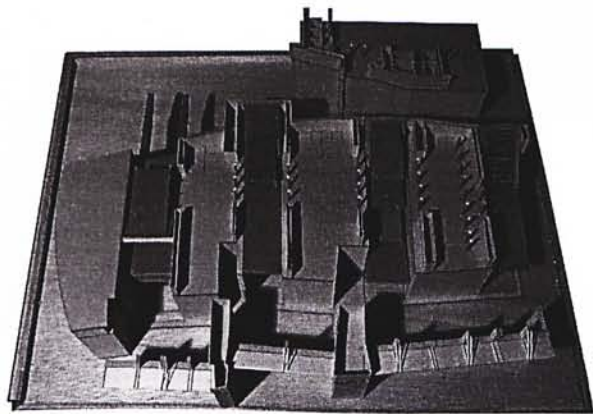


Process of development





Process of development





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